CHINA.

IMPERIAL MARITIME CUSTOMS.

II.—SPECIAL SERIES: No. 2.

MEDICAL REPORTS,

FOR THE HALF-YEAR ENDED 31ST MARCH 1880.

19th Issue.

PUBLISHED BY ORDER OF

The Inspector General of Customs.

SHANGHAI:
STATISTICAL DEPARTMENT
OF THE
INSPECTORATE GENERAL.

MDCCCLXXX.

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Inspector General's Circular No. 19 of 1870.

Inspectorate General of Customs,

Peking, 31*st December* 1870.

SIR,

1.—It has been suggested to me that it would be well to take advantage of the circumstances in which the Customs Establishment is placed, to procure information with regard to disease amongst foreigners and natives in China; and I have, in consequence, come to the resolution of publishing half-yearly in collected form all that may be obtainable. If carried out to the extent hoped for, the scheme may prove highly useful to the medical profession both in China and at home, and to the public generally. I therefore look with confidence to the co-operation of the Customs Medical Officer at your port, and rely on his assisting me in this matter by framing a half-yearly report containing the result of his observations at.....upon the local peculiarities of disease, and upon diseases rarely or never encountered out of China. The facts brought forward and the opinions expressed will be arranged and published either with or without the name of the physician responsible for them, just as he may desire.

2.—The suggestions of the Customs Medical Officers at the various ports as to the points which it would be well to have especially elucidated, will be of great value in the framing of a form which will save trouble to those members of the Medical profession, whether connected with the Customs or not, who will join in carrying out the plan proposed. Meanwhile I would particularly invite attention to—

a.—The general health of.....during the period reported on; the death rate amongst foreigners; and, as far as possible, a classification of the causes of death.

b.—Diseases prevalent at.....

c.—General type of disease; peculiarities and complications encountered; special treatment demanded.

d.—Relation of disease to { Season. / Alteration in local conditions—such as drainage, &c. / Alteration in climatic conditions.

e.—Peculiar diseases; especially leprosy.

f.—Epidemics { Absence or presence. / Causes. / Course and treatment. / Fatality.

Other points, of a general or special kind, will naturally suggest themselves to medical men; what I have above called attention to will serve to fix the general scope of the undertaking. I have committed to Dr. Alex. Jamieson, of Shanghai, the charge of arranging the reports for publication, so that they may be made available in a convenient form.

3.—Considering the number of places at which the Customs Inspectorate has established offices, the thousands of miles north and south and east and west over which these offices are scattered, the varieties of climate, and the peculiar conditions to which, under such different circumstances, life and health are subjected, I believe the Inspectorate, aided by its Medical Officers, can do good service in the general interest in the direction indicated; and, as already stated, I rely with confidence on the support and assistance of the Medical Officer at each port in the furtherance and perfecting of this scheme. You will hand a copy of this Circular to Dr. ....., and request him, in my name, to hand to you in future, for transmission to myself, half-yearly reports of the kind required, for the half-years ending 31st March and 30th September—that is, for the Winter and Summer seasons.

4.— * * * * *

I am, &c.,

(signed) ROBERT HART,
I. G.

THE COMMISSIONERS OF CUSTOMS,—*Newchwang*, *Ningpo*, *Tientsin*, *Foochow*, *Chefoo*, *Tamsui*, *Hankow*, *Takow*, *Kiukiang*, *Amoy*, *Chinkiang*, *Swatow*, and *Shanghai*, *Canton*.

SHANGHAI, *1st September 1880.*

SIR,

IN accordance with the directions of your Despatch No. 6 *A* (Returns Series) of the 24th June 1871, I now forward to the Statistical Department of the Inspectorate General of Customs, the following documents:—

A.—Report on the Health of Newchwang, pp. 1–4;
B.—Report on the Health of Tientsin, p. 5;
C.—Report on the Health of Chinkiang, pp. 6–8;
D.—Report on the Health of Kiukiang, pp. 9–10; each of these referring to the year ended 31st March 1880.
E.—Report on the Health of Swatow, pp. 11–15;
F.—Report on the Health of Canton, p. 16;
G.—Report on the Health of Shanghai, pp. 17–29;
H.—Report on the Health of Amoy, p. 30;
I.—Report on the Health of Chefoo, pp. 31–32; each of these referring to the half-year ended 31st March 1880.
Notes on Sprue, by Dr. MANSON, of Amoy, pp. 33–37.
A Monograph on Beriberi, or the "Kakké" of Japan, contributed by Dr. D. B. SIMMONS, of Yokohama, pp. 38–76.

I have the honour to be,

SIR,

Your obedient Servant,

R. ALEX. JAMIESON.

THE INSPECTOR GENERAL OF CUSTOMS,
PEKING.

The Contributors to this Volume are—

JAMES WATSON, M.D., L.R.C.S.E.	Newchwang.
A. IRWIN, L.K.&Q.C.P., L.R.C.S.I.	Tientsin.
R. G. WHITE, L.S.A., M.R.C.S.	Chinkiang.
J. JARDINE, M.D., CH.M.	Kiukiang.
E. I. SCOTT, L.K.&Q.C.P., L.R.C.S.I.	Swatow.
F. CARROW, M.D.	Canton.
R. A. JAMIESON, M.A., M.D., M.R.C.S.	Shanghai.
P. MANSON, M.D., CH.M.	Amoy.
J. G. BRERETON, L.K.&Q.C.P., L.R.C.S.I.	Chefoo.
DUANE B. SIMMONS, M.D.	Yokohama, Japan.

A.—Dr. James Watson's Report on the Health of Newchwang for the Year ended 31st March 1880.

The climate of this district during the year under review may upon the whole be considered an average one. The first half of spring was extremely boisterous, but the latter half and the whole of summer were pleasantly free from gales and from those strong winds, little less than gales, which rendered animal and vegetable life in April, and some days in May, a hard fight. There was rather more than the usual amount of rain, which did little harm to anyone except those who lived in houses with floors insufficiently raised above the ground; while the farmers, with few exceptions, were greatly benefited by it. Generally, the crops were good; and the common people had enough to eat, and were free from serious disease.

The winter was decidedly mild, although one or two days were exceptionally cold. But as only a moderate amount of snow fell, and as there were but few days when strong winds occurred, our winter weather was very pleasant. It is often remarked by delicate residents how much better they bear the cold of this somewhat Arctic region than that of Shanghai and the River Ports.

Two of my lady patients have just passed their first winter in Newchwang, and while one of them is far from robust, the other has been for some time an invalid; yet so far as the climate has had any effect on their constitutions, it has been favourable.

The general health of the European and Chinese population during the year has been good. In my practice among the former, I have had several interesting and somewhat serious cases, which were little, if at all, affected by the peculiar climate of this place; but for obvious reasons I do not refer to them more particularly. The Chinese in the native town suffered slightly from small-pox, but a large trading mart, distant from this port some 30 miles up the river, has been visited by a severe epidemic of that disease, which has been sadly fatal. With, however, the exception of a moderate amount of small-pox and a somewhat larger number than usual of cases of febricula and typhus-like fever, our near native neighbours have enjoyed excellent health.

The following are brief notes of a few cases in this year's practice:—

Premature Labour (at Six Months).—A. B., æt. 26; second pregnancy; during the whole time of pregnancy was in a feeble state of health, and absolutely incapable of taking exercise. The labour pains were irregular and weak, and as symptoms of exhaustion set in, I administered chloroform, turned the child, and so delivered it. The infant was asphyxiated when born; but although respiration was eventually fully established, it only lived a few hours. The mother made a good recovery.

Puerperal Convulsions.—C. D., æt. 28; first labour; full time; delivered by forceps. Patient is of a weak constitution, but labour progressed satisfactorily until the os was fully dilated, and the head of the child was in the lower outlet of the pelvis. Soon after this the pains became weak and irregular, and about 2 P.M. she had a violent convulsion, and I was sent for. I found my patient tired and dazed, but labour had progressed considerably since my last visit to her some hours previously. About 3 o'clock, when I was sitting beside her, another fit occurred, and the neck, hands and legs were thrown into violent convulsion, and froth welled from the mouth. This was evidently an epileptic attack. Six convulsions took place before I gave chloroform and delivered the child by forceps, an operation which I considered necessary, as the mother seemed rapidly sinking. The child, which had a rather large head, weighed eight and a half

pounds, and was in every way vigorous when born. Immediately after the birth of the child the mother was extremely prostrated, but she made so good a recovery that at the end of three weeks she was able to move about the house. No convulsions took place after the birth of the child; and the urine, when examined soon after labour was completed, had only a trace of albumen in it. My patient assures me that neither she nor any member of her family has previously suffered from convulsions of any kind. During the fits her tongue was deeply cut on both sides, and it became greatly swollen, so that eating was a difficult matter, and distinct utterance an impossibility.

Concussion, with Compression of Brain.—E. F., æt. 42, a member of the Out-door Customs staff, was one day in January driving in a native cart, when the mules, taking fright, ran off with him. He somewhat thoughtlessly raised himself on the shafts and jumped from them while the vehicle was in rapid motion, and the back of his head came with great violence into contact with the hard, frost-bound road. He was picked up in a semi-conscious state and taken to his house, which fortunately was close at hand. I found him suffering from shock (concussion), but soon afterwards symptoms of compression set in as well. The pulse was slow, and for the space of two weeks its beat was seldom more than 36 per minute. It was also somewhat irregular. For about 14 days my patient lay in a state bordering on coma, from which he was occasionally aroused by acute pain in the head. There was very marked muscular weakness, but no paralysis. He complained of inability to sleep, and persistent headache for several weeks. About the fifteenth day after the accident the pulse began to improve, and it was interesting to note the regular manner in which its beat increased by about three every two days, until it reached 60 per minute, at which it stopped, until my patient was well enough to move about a little and take nutritious food.

I have never before seen a case in which symptoms of shock were so distinct, and those of compression so pronounced, without a certain amount of fever supervening. In the present case there was not a hint of fever throughout its course; and I think the fortunate termination of the accident is greatly due to the fact that from boyhood my patient had been practically a total abstainer. For a good many weeks after returning to duty he was feeble and easily tired; but he is now as strong and active as he used to be before his accident.

Pistol-shot Wound of Hand; Amputation above Wrist.—A Ningpo sailor, belonging to a Chinese gun-vessel, was handling carelessly a large pistol, when it suddenly went off, and discharged its contents into his hand, which was greatly lacerated. I was asked to see him in the native town, about two miles from my house. It was quite evident, even to the Chinese, that amputation was necessary; and, having brought the man to the foreign settlement, I amputated the hand a little above the wrist. When I first saw him there was a considerable oozing of blood from the hand, and to stop it I applied a bandage, which so effectually controlled the blood vessels that when I amputated, some three hours afterwards, and that well beyond the injured tissues, I could only find one artery (the radial) to ligature. I was afraid secondary hæmorrhage would set in, and I left a servant to look out for this accident, but the wound healed throughout by the first intention without any further loss of blood.

Hydrocele; Operation.—During the winter a Chinaman from Moukden consulted me about a large swelling of the scrotum which he said had annoyed him, and for which he had been treated by several members of the native faculty for the last five years without any benefit.

On the right side was a large and solid tumour, and I found it difficult to make out fluctuation; the walls of the sac were thickened to such an extent that even in a darkened room it was not possible to transmit light from a candle through them. The left testicle was also enlarged. I tapped the hydrocele, and drew off rather more than 48 ounces of a straw-coloured fluid, and then injected three drachms of tincture of iodine into the tunica vaginalis. After four weeks there was a considerable re-accumulation of fluid, which I again drew off, and re-injected the sac. In a few weeks after the second injection of iodine, the hydrocele was cured, the enlarged testicle reduced in size by one half, and my patient returned to Moukden.

Penetrating Wound of Abdomen, with Protrusion of the Gall-bladder, Omentum, and Small Intestine.—In the spring of 1879, one of the cargo-boats in the river was being brought alongside of a steamer, to which

already several similar boats were lashed. The tide was at the time strong, and the sailors, failing to secure their boat to the steamer with their hooks, flung a small grappling anchor on board one of the boats already fastened to the steamer. Unfortunately, the anchor caught a lad of about 14 years of age, who was on deck at the time, in the lower third of the abdomen, on the right side, and dragged him into the river, which was running at the rate of six miles an hour. The boat was carried past the steamer a considerable distance before it was brought to anchor, and the wounded boy was in the meanwhile in the water. He was eventually picked up, and the next day I was asked to see him, some 14 hours after the accident. I found a triangular wound through the abdominal walls on the right side, which, with the opening into the peritoneum at the lower edge of the liver, was completely hidden from view by a tumour, consisting of the gall-bladder, about three feet of small intestine, and a portion of the omentum. These were lying dry and matted together by the side of the boy who, pale and exhausted, was stretched on his back on a native brick bed. After sponging the viscera with warm water, I managed, with little difficulty, to get this formidable-looking mass returned into the abdominal cavity.

As the two sides of the triangular wound in the walls of the abdomen together measured about 10 inches, and that in the peritoneum was large enough to permit the ends of three fingers to enter it, I considered it prudent to stitch up the latter with a couple of sutures. The external wound was also closed with several sutures, and a pad and bandage applied over it. The pulse was, after the reduction of the tumour, 120, and very weak. I prescribed opium, and the boy was allowed rice water in small quantities. For eight days the pulse became gradually slower, and the case progressed satisfactorily. I was beginning to believe that the boy would pull through, when, against my instructions, someone who visited the lad gave him, in response to his earnest request for solid food, a number of heavy indigestible cakes. These he ate, and they speedily brought on a violent fit of retching, and he vomited a large round worm. This effort burst the stitches; and the wound, which up to this time looked promising, took on an unhealthy action. Symptoms of peritonitis set in, and he died 12 days after the accident. I believe that if I could have kept the boy entirely under my own control, and prevented him eating those indigestible cakes, he had a very fair prospect of recovery. In spite of the unsatisfactory result, the case is interesting. To sustain such a terrible injury as I have described, to be afterwards dragged with violence into a rushing river (with the temperature about freezing point), and to remain in it some four or five minutes, to be brought on shore, and lie for 12 hours with such a tumour exposed to the action of the air before it was reduced, and, in spite of unsatisfactory nursing, to live for 11 days afterwards, is an illustration of vitality which we do not frequently meet with in practice.

In former Reports I have frequently had occasion to remark on the unsatisfactory health of the little colony of Roman Catholic sisters (10 in number), who for several years past have laboured at this port. During the past twelve months there has not been a single case of serious illness among them. Several of the sisters have been on the sick list, but all the cases have been of a chronic character, and were referable to constitutional weakness, or overwork. This somewhat marked immunity from serious ailments in the members of the Catholic Mission is in a measure explained by the improved sanitary condition of their compound, and the increased vigilance exercised by the lady superior in detecting the first approaches of disease, and at once relieving from full duty any sister who shows symptoms of failing health or strength. It is also an indirect proof of the fair health of the native population during the year, as when in the past serious sickness abounded amongst the Chinese, their faithful friends the sisters have invariably suffered too.

During the past year there were four births and one death (that of the prematurely-born child referred to above) among the foreign residents.

Mr. DEIGHTON-BRAYSHER, Harbour Master, has kindly assisted me in drawing up the Meteorological Table which I append to this Report.

METEOROLOGICAL TABLE for the Year ended 31st March 1880.

YEAR AND MONTH.	Highest Reading of Barometer (Aneroid) for the Month.	Lowest Reading of Barometer (Aneroid) for the Month.	No. of Days Temperature fell below Zero.	No. of Days Temperature fell below 10°.	No. of Days Temperature fell below 20°.	No. of Days Temperature fell below 32°.	No. of Days Temperature fell below 42°.	No. of Days Temperature was above 65°.	No. of Days Temperature was above 70°.	No. of Days Temperature was above 75°.	No. of Days Temperature was above 80°.	No. of Days Temperature was above 85°.	No. of Days Rain fell for upwards of 2 Hours in the 24.	No. of Days Snow fell for upwards of 2 Hours in the 24.	No. of Days no Rain or Snow fell.	No. of Days Thunderstorms occurred.	No. of Local Duststorms.	No. of Days High Winds prevailed for a longer period than 2 Hours in the 24.
1879.																		
April	30.56	29.61	...	...	...	12	20	1	...	...	...	...	5	2	20	...	2	8
May	30.16	29.54	...	...	...	...	2	17	4	1	...	...	8	...	22	3	...	1
June	30.22	29.56	...	...	...	...	...	29	28	26	9	3	6	...	23	1	...	...
July	30.08	29.49	...	...	...	...	...	31	31	29	23	6	7	...	23	3	...	1
August	30.16	29.50	...	...	...	...	...	31	31	29	23	...	6	...	24	2	...	1
September	30.24	29.75	...	...	...	...	...	28	27	12	1	...	3	...	26	1	...	2
October	30.70	29.90	...	...	...	1	16	2	...	...	...	...	4	...	24	...	...	2
November	30.75	29.76	...	...	...	23	30	...	...	...	...	...	2	1	25	...	...	1
December	30.70	29.73	...	11	24	31	31	...	...	...	...	...	2	3	26	...	...	4
1880.																		
January	30.97	30.04	4	29	31	31	31	...	...	...	...	...	...	2	28	...	...	1
February	30.89	30.14	3	15	29	29	29	...	...	...	...	...	...	2	27	...	...	...
March	30.74	29.68	...	...	5	21	31	...	...	...	...	...	2	2	27	...	...	3

REMARKS.—The barometer showed a higher reading than in previous years, nor was the depression as low as might have been expected.

For the twelve months ending 31st March 1880, the temperature generally was lower than that usually experienced. The highest register was 90°, on the 8th August. In April the minimum reading (on the 7th) was 22° F. Snow fell on the 19th, and frost continued up to the 23rd. In the month of February (1880), the mercury fell much lower than has been known for many years. One instrument marked – 19°, but beyond a certain range our thermometers are, I fear, not to be depended upon.

There was an unusual amount of moisture in December. Rain fell on the 13th, with the thermometer at 42°; and again on the 27th. This was an unprecedented occurrence.

With the exception of the month of April, there were fewer gales than usual; two only being worthy of note. The blow on the 31st July and 1st August clearly proved that typhoons on this coast extend farther north than is generally supposed, and though the centre of this storm passed a long way to the southward and eastward of this district, yet we were sensibly affected by it. The hardest gale occurred in December, when its force was 8, from 8 P.M. of the 7th to 4 P.M. of the following day, the wind veering from N. to N.N.E., accompanied by snow. The thermometer fell to 2°, and the river was frozen hard from bank to bank. The severity of the weather during these two days was extreme. Numbers of the poor succumbed to its bitter influence. Even the hardy magpie fell dead in the streets, while 50 miles to the north of this settlement many pheasants and partridges were picked up which had been killed by the frost.

The barometrical readings were taken from an instrument placed about 8 feet above high-water level. The thermometer was hung under a verandah in a shaded situation, facing the north.

B.—Dr. A. Irwin's Report on the Health of Tientsin for the Year ended 31st March 1880.

For the past twelve months the health of foreigners at this port was remarkably good. The autumn months contributed most to the sick list, but with no cases of special severity. Diarrhœa, dysenteric attacks, and intermittents were the forms of disease prevalent during that time. We have experienced a very mild winter, and commenced spring well; no duststorms of any duration, and with clear, open weather, very different indeed from the spring and winter of 1879. The surrounding country continues flooded. We have to thank the Tientsin Municipal Council for many improvements in the settlement and its neighbourhood, notably for the improved condition of the roads and the drainage system of the concession, and also for a raised road through the plain at the back of the settlement, which has been thickly planted with trees. The road, constructed on the old fortifications, extending for two miles and a half along the canal, has proved a great boon. The numbers who daily use the roads show how thoroughly they are appreciated, and when the roads are completed and the intervening spaces planted with trees, as I suggested last year, the community will derive great benefit from them. The trees and raised road will completely shut the settlement off from the foul plain which lies between it and Tientsin city.

The Foreigners admitted to the hospital during the twelve months were 33, as follows:—

Frostbite	4 cases.	Fracture	4 cases.
Dysenteric diarrhœa .	6 „	Anæmia	1 „
Dysentery	2 „	Intermittent fever .	3 „
Eye disease	3 „	Various	10 „

These were all non-residents.

Whooping-cough was very prevalent among the Chinese during September, October and November, and six European children contracted the disease. It was of a very mild character, and in no case were there any alarming symptoms. Entozoa, of different varieties, are very frequently met with; the natives suffered most from lumbrici, and several foreigners from tænia. The only form of tænia I have met with here is the mediocanellata. There were eight births during the year—five girls, three boys.

There was one death from phthisis. The disease was not contracted in China.

C.—Dr. R. G. White's Report on the Health of Chinkiang for the Year ended 31st March 1880.

The health of the community has been on the whole good, especially when we remember the protracted heat of the summer, which proved most trying to some old residents in the port. The following table has been supplied to me through the kindness of the Harbour Master, Mr. Günther. The heat was more distressing from its duration than from its intensity at any one time.

Meteorological Table.

Year and Month.	Thermometer.				No. of Days Rain and Snow.		Depth of Rainfall.	Tides.			
	Day.		Night.					Highest Water.		Lowest Water.	
	Max.	Min.	Max.	Min.	Rain.	Snow.					
1879.	°	°	°	°			*Inches.*	*Ft.*	*in.*	*Ft.*	*in.*
April	74	42	70	42	6	...	3.52	8	4	1	2
May	84	61	80	60	13	...	9.30	10	10	1	3
June	90	60	86	62	7	...	2.94	13	1	8	4
July	93	79	93	78	5	...	3.79	14	5	10	7
August	92	77	90	75	9	...	3.83	14	6	9	3
September	87	68	83	68	9	...	6.67	12	4	7	9
October	74	50	73	50	6	...	2.96	11	6	5	11
November	62	43	64	42	4	...	1.87	10	4	2	6
December	58	29	53	27	1	...	0.05	7	6	...	
1880.											
January	44	25	44	29	4	7	1.87	5	5	...	
February	44	33	45	30	10	2	2.38	8	10	0	1
March	63	35	67	34	5	...	1.78	8	2	2	2

I should mention that the thermometer from which the above is registered is placed in a specially cool position. The thermometer in our dwellings reached 97° and 98° on several days during the months of July and August.

During the year there have been no deaths among the foreign community. Three births occurred—two boys and one girl. The confinements were all natural and uncomplicated, though in one case, on a former occasion, instruments and chloroform had been requisite. Intermittent fever was observed at the close of summer and during the autumn; among the natives it was prevalent to an unusual degree.

One case of typhoid fever occurred; the patient was a resident from Wuhu, but had been there only a short time. The case was a typical one; the head symptoms were most marked, while successive crops of rash, the evacuations from the bowels, and the thermometer indications, left no doubt as to the nature of the case. I am under the impression that there has been doubt as to cases of enteric fever occurring in the valley of the Yangtze. In addition to the above-mentioned case, I had also a Chinese patient with similar well-marked symptoms. It was interesting to note the effect of wine on the first-named patient. Although so useful in some cases, when on the twenty-fifth day some wine was administered, immediately an increased temperature to 102° was the result. Three days after, when wine was again exhibited, a similar result occurred. The patient recovered completely.

Practice among the Chinese of any special interest has been chiefly of a surgical nature, and in many cases ordinary intelligence at the early stage of the disease would have prevented any serious lesion. Thus, some 12 patients presented themselves for treatment with necrosis of the inferior maxilla, the bone having necrosed in consequence of neglected or badly managed alveolar abscess, though the neglected cases were by no means so severe as those in which there had been an unlimited amount of plaster used.

A mandarin from Hunan presented himself, and gave a history of a carious tooth, which inflamed and resulted in necrosis of the left half of the lower jaw; he had been treated by many native surgeons, but not with any good result. The patient was much reduced, there was a profuse discharge from a sinus, which was so large that half the food escaped from the mouth during mastication. The necrosed bone was removed under chloroform, and a speedy recovery resulted as regards general health; there was, however, considerable difficulty experienced in effecting complete closure of the sinus; at its lowest part it was immediately under the sub-maxillary gland, and the constant flow of saliva kept it open. The wound was, however, reduced from $4\frac{1}{2}$ inches wide to $\frac{3}{8}$ in., and but for the impatience and opium-smoking of the patient, no doubt the cure would have been complete in a few more days; but being so much improved from his former condition, he was satisfied sooner than his medical attendant.

Several cases of malignant disease have come for treatment, and the development attained is rarely seen at home, when surgical treatment would have interfered with the disease.

A man from north of the river came to the dispensary and presented his right side for examination, with a cancerous mass, involving the mammary gland, and extending from his clavicle down some 12 inches × 10 inches at base. The mass was firmly adherent to the ribs, the axillary glands stood out, four being as large as walnuts, and two as large as mandarin oranges. The tumour, according to the patient's account, had existed two years; it had grown slowly at first, was painless, and there was no impairment of general health for the first year. During the second year there was rapid growth, and general health suffered by loss of flesh. Three months before coming, ulceration had set in, attended with profuse discharge and great prostration. The final result was no doubt rapid, but patient hearing that no operation could be performed, returned home and did not present himself again.

Four cases of epithelioma of the lip were operated on; three of the number were in females, and one of these was of the upper lip. Four other cases were seen, but operation was declined, and of these three were females. These cases, it will be observed, form exceptions to the general rule.

Inguinal hernia, direct or indirect, seems to be most common among the Chinese in this locality, and in the majority of cases there does not seem to be any desire to remedy the abnormality; in fact, little inconvenience seems to be experienced, unless the hernia assumes a

very large size, and then only on this account relief is sought. I have not seen or heard of a case of strangulation, and, in fact, only very few cases present themselves which are not easily reduced. Many fatal cases of childbirth have been reported, from ignorance in the management on the part of the midwives. According to accounts from native sources, labours have extended over four days (and even six days have been mentioned), the delay being caused by cross-birth, and the result, of course, fatal.

On being summoned to a case last February, the patient was found to have been in labour 48 hours; all was supposed to have been going on well, until the liquor amnii came away the day previous to my visit, and then the arm of the child was found presenting. After traction on the arm had been tried for some time without any good result, another midwife was summoned, and then another. These all requested that some one of higher reputation should be summoned, and accordingly a fourth woman was called, and she, with more temerity than her predecessors, cut off the presenting arm, and soon after, with them, left the house. Examination revealed a mass which consisted of the mutilated shoulder and ribs of the child in a state of advanced decomposition, the mass was fixed and firmly held by the uterus, which now contracted but feebly at each pain; the parts of the mother were almost in a sloughing condition, her pulse was fairly good. To allay her pain during the necessary manipulation, and her alarm at the presence of a male foreigner, chloroform was administered, and then a large quantity of urine was drawn off. It was impossible, without dangerous exertion, to turn the mass occupying the outlet of the pelvis, so evisceration was effected, and then decapitation, after which a dose of ergot was administered, and with a little traction by means of the blunt hook, the body was born, which was soon followed by the head. The friends of the woman wished her treated according to native custom after delivery, so the result as to the soft parts could not be accurately ascertained; there was no doubt considerable sloughing, but no fistulæ have been reported, as would have been had they occurred.

D.—Dr. J. JARDINE's Report on the Health of Kiukiang for the Year ended 31st March 1880.

DURING the period now reported on the health of this community has been very good. The only cases which caused great anxiety were one of typhoid fever of a grave character, which ultimately made an excellent recovery under treatment detailed in a previous Report, and one which unfortunately succumbed to serous or sero-sanguineous effusion into the brain, chest and other parts of the body, the result of an attack of scorbutus.

The latter patient had been suffering for over two months from swollen and bleeding gums before he came under observation, and he stated that he had been living almost exclusively on tea and toast, and carefully abstaining from a fresh meat and vegetable diet. He looked out of health, his countenance pale, sallow and earthy, and he complained that his gums bled on the slightest provocation. On examination, the gums were found swollen, soft and discoloured, and bled on the slightest touch, and several livid spots were observed on the palate. This led to the discovery of ecchymoses as large as the palm of the hand on the right arm and left leg, and smaller extravasations on various parts of the body. He complained of stiffness of his legs, and breathlessness on walking upstairs. There was no epistaxis, hæmatemesis, hæmaturia or albuminuria. His appetite was bad, the bowels constipated, and he suffered from hæmorrhoids. He was depressed, listless and indisposed to exertion. He had been recently married, and had left his wife in England, about whom he was constantly fretting. This continuous yearning and solicitude after the object of his affections preyed on his health and spirits, and caused him to neglect himself.

He was ordered an antiscorbutic diet of a generous character, lime-juice, milk, and tincture of perchloride of iron and quinine; but it is certain that he still continued to neglect himself. After three weeks treatment, the swelling and bleeding from his gums were much less, and most of the livid spots had disappeared from his body, but the depression and debility were still greater, and dyspnœa on exertion had increased. At this time he complained of dimness of sight, specially at night, inability to sleep, and there was a diffuse puffiness round his left orbit. Headache and vomiting supervened, drowsiness and coma set in, and he died.

Scorbutus, though usually a favourable and tractable disease before any of the internal organs have become seriously involved, is undoubtedly serious enough if in addition the patient's constitution is debilitated from lengthened residence (17 years) in the East, if his digestive functions are so impaired that mal-assimilation takes place, if he is depressed and brooding over other troubles, and getting advanced in years. This combination of unfavourable circumstances presented themselves in this case, caused him to disregard himself, and materially contributed to precipitate the fatal issue.

Two cases of congestion of the liver, treated by large doses of muriate of ammonia, and counter-irritation, recovered perfectly.

A case of subacute dysentery, treated by rectal injections and ipecacuanha and opium, made a very speedy recovery. This patient, who had suffered from previous attacks, attributed his more speedy recovery on this occasion to the action of the local treatment. This method of treating dysentery by rectal injections is favourably noticed in *The Practitioner* for December 1879, pp. 448, 449.

Two priests belonging to the Catholic Mission, who had been resident for some years in the south of this province, arrived here last autumn, one suffering from chronic dysentery, the other from extreme emaciation, debility, and almost imbecility, as far as the condition of his mental faculties were concerned, consequent on several attacks of fever of the remittent type. Both made excellent recoveries; we can scarcely, however, consider them residents at this port, as they came here solely for the purpose of procuring medical assistance. The above forms the summary of important cases in a year's work among foreigners.

Among natives, an interesting case of accidental pistol-shot wound in the abdomen came under observation, and ended in complete recovery.

The patient, a woman, aged 28, was playing with a loaded pistol (it being unknown to her that the weapon was loaded), when she accidentally discharged the contents of one chamber into her abdomen, at a point in the umbilical region two inches to the left of the umbilicus and an inch and a half above it. The bullet passed through the abdomen and emerged at a point above the position of the left kidney. A dressing of carbolic oil was applied to both apertures, a binder firmly wound round her abdomen, full doses of opium administered every four or five hours, and the diet limited to a little tea and congee. She suffered from a considerable amount of shock for a few hours, when severe pain commenced in the abdomen, and continued for a week, when she began to show signs of improvement. The posterior orifice had closed at the end of a fortnight, and the anterior one by the eighteenth day, and in three weeks she had regained her usual health and appearance. Whether the bowel was wounded or not must remain a mystery, but as the pistol must have been in close proximity to her body when it was discharged, some charred powder and the wad must have penetrated into the abdominal cavity, so that it was marvellous that fatal peritonitis was not lit up. The bullet was afterwards found among her clothes, but no trace of the wad could be discovered. The pistol was an ordinary five-chambered revolver.

On reference to statistics relating to penetrating wounds of the abdomen in the British army during the Crimean war, it will be found that out of 124 cases, 115, or 92.7 per cent., died; and in the French army, out of 121 cases, 111, or 91.7 per cent., died.

E.—Dr. E. I. Scott's Report on the Health of Swatow for the Half-year ended 31st March 1880.

I am indebted to the courtesy of Mr. Harbour Master Rae for the appended table of meteorological observations for the past six months:—

Abstract from Meteorological Table.

Year and Month.	Winds.					Mercurial Barometer.				Thermometer.						Rain and Fog.			Tides.	
	Number of Days N. to E.	Number of Days E. to S.	Number of Days S. to W.	Number of Days W. to N.	Number of Days Calm.	Highest by Day.	Lowest by Day.	Highest by Night.	Lowest by Night.	Highest by Day.	Lowest by Day.	Highest by Night.	Lowest by Night.	Average Wet Bulb.	Average Dry Bulb.	Number of Days Rain.	Number of Inches Rainfall.	Number of Days Fog.	Average Rise, Spring Tides.	Average Rise, Neap Tides.
1879.	*D. h.*	*D. h.*	*D. h.*	*D. h.*	*D. h.*	*Inch.*	*Inch.*	*Inch.*	*Inch.*	°	°	°	°	°	°	*D. h.*	*Inch.*	*D. h.*	*Ft. in.*	*Ft. in.*
October.....	20 20	5 4	0 4	2 16	2 4	30.25	29.92	30.25	29.98	89	73	80	68	75	79	0 20	2.21	...	7 9	5 6
November...	13 16	5 20	0 16	6 16	3 4	30.29	29.98	30.27	29.85	86	60	71	51	65	68	3 0	4.16	...	6 9	4 6
December...	17 4	7 12	1 0	2 20	2 12	30.42	30.05	30.38	30.07	90	53	76	50	59	65	...	...	...	7 6	5 6
1880.																				
January	20 12	6 0	...	2 12	2 0	30.40	30.09	30.43	30.12	68	45	60	40	56	60	3 13	2.02	...	7 9	5 6
February.....	21 8	4 12	0 4	1 20	1 4	30.40	30.12	30.39	30.05	66	49	60	48	59	61	2 3	1.90	...	6 0	4 0
March	8 12	17 20	0 12	1 16	2 12	30.40	30.00	30.38	30.02	85	52	69	51	58	67	0 4½	0.05	0 19	5 9	5 3

Note.—Tides very irregular; not to be depended on, being greatly influenced by the winds.

The thermometric records show what a very mild winter we experience here, and the observations relating to rain and fog show how very dry our winter climate is, there being only 9 days 16 hours and 31 minutes rain during the six months, the rainfall being 10.34 inches for that period. I have little to say concerning the health of the port, which has been uncommonly good, as I have had hardly any serious cases among the residents or afloat. It was an ordinary thing to have a clean bill of health for the whole port, with no one at all on the sick list. Too much cannot be said of the healthiness of Swatow during the winter months. Under these circumstances, I was hoping to have no death to record, but two men got fighting, and one stabbed the other in the back with a sheath knife, and the man died next day from hæmorrhage into the cavity of the thorax. This unfortunate accident, of course, does not reflect unfavourably on the health of Swatow, but necessarily adds one more to the list of those dying here. The case is of some interest, as the man was fatally wounded in the 'tween decks of the ship, and was able to walk to the doctor's cabin on the upper deck and call the doctor before he became faint from the injury, and fell down.

He showed no signs of a lung wound at the time, as there was neither bloody sputum, frothing at the wound, or emphysema of the skin. From the time of the injury till he died, 25 hours afterwards, he had no serious symptoms, and had a full, steady pulse throughout, and not much dyspnœa. Shortly before he died he asked for food, and ate some arrowroot, but, while in the act of eating, suddenly collapsed and died. I did not see him during his lifetime, and had the above account from the ship's surgeon. The postmortem examination showed a penetrating wound on the right side of the back, about 2 inches from the spine, passing downwards and forwards from about the sixth or seventh rib to the upper margin of the tenth rib, which was splintered. On opening the thorax, the right side was found full of blood, fluid and clotted, the lung collapsed and tight to the spine, and the external wound entering the chest at the upper margin of the tenth rib. A wound was also found in the lower lobe of the lung, cutting it almost in two.

It is strange that such a severe injury should have given rise to so few symptoms before death actually occurred. A case of hæmorrhage from a tooth may be of sufficient interest to report here.

B. D., a strong, healthy man of 35 years, came to me one day complaining of a lump under his jaw, and great pain and fever. On examination I found there was a swelling of the glands at the angle of the jaw, with considerable pain and puffiness; so I concluded there was matter not far off. On asking him to open his mouth, I found he could hardly do so; and, with difficulty, I was able to see enough to tell me that he was cutting one of his wisdom teeth. This accounted in a great measure for most of his trouble, and I incised the gum freely over the tooth, and left him with poultices over the inflamed glands. Next day he was easier, and there was free discharge of some rather fetid matter, and so he progressed favourably, and was getting all right, when bleeding began from around the tooth. As first in small quantities, and he thought little of it, but from day to day the amount increased; and, after a week, he again came to me, as he himself said, "bleeding like a pig." When I saw him there was no blood coming, and I was inclined to look on his account as an exaggeration, and gave him a styptic lotion to wash with, and requested to see him should the bleeding return. For three days he continued pretty free from his trouble, and thought he was all right, but on the same night he awoke with his mouth full of blood, and he continued to bleed for six hours, when he came to me quite faint and frightened. On looking into his mouth I could see the blood oozing steadily from the gum inside and next to the last tooth—the new one; as he cleaned the mouth with water, the blood could be seen welling up around the tooth and overflowing into the mouth. Pressure round the tooth seemed to have no effect in stopping the flow, which was bright red blood. I proposed to take out the tooth and look for the bleeding vessel, but this he objected to before trying other remedies. I accordingly applied the solid perchloride of iron around the tooth, *inside* the gum, with a very finely cut pencil of soft wood, and gave him ergot and iron internally. This had the desired effect for 12 hours, when the bleeding recommenced. Another application of the perchloride of iron, however, effectually stopped it this time, and it did not return again.

That the eruption of the wisdom teeth is often painful and difficult is well known, and all the symptoms this man suffered from are mentioned by SALTER, in *Holmes' System of Surgery*, with the exception of the hæmorrhage. Hæmorrhage after extraction of teeth is a complication occasionally met with, but I cannot find any mention of this complication of tooth eruption. I could find no reason for this bleeding, as the man had no hæmorrhagic diathesis, and had never bled before in his life from anywhere, and was a strong powerful man, with active out-of-door occupation. Such a case might have serious consequences, and in this one the bleeding was quite sufficient to be alarming.

Following the example of Dr. JAMIESON of Shanghai, and Dr. SOMERVILLE of Foochow, I will here add a contribution from obstetric practice among foreigners in China. I have before

me notes of 80 consecutive cases of labour in my practice in South China, 78 of which occurred at full time, and 2 at seven months. They consist of—

First labour	27 cases.	Sixth labour	3 cases.
Second „	19 „	Seventh „	3 „
Third „	11 „	Eighth „	2 „
Fourth „	9 „	Ninth „	1 „
Fifth „	5 „		

Of the 27 first labours, all were single births, of which 26 were at full time, and one at seven months. There were 22 natural labours; one had an adherent placenta, which I was obliged to scrape away from the uterine walls; one had retained placenta, from irregular muscular contraction; there was one tedious labour, in which the child was mutilated by a Chinese nurse before I was called, the nurse cutting open the child's scalp with a scissors, under the impression she was opening the membranes to allow escape of waters; two laborious labours, in which I was obliged to apply forceps (both these occurred in strong muscular women, not very young for primiparæ), symptoms of exhaustion setting in in both cases. Of these 27 cases, all the mothers lived and made good recoveries.

Of the 27 children born, 10 were girls and 17 boys, and of these all but three lived; one, mentioned above as having been mutilated before birth by a Chinese nurse, which only lived two days; one, which only survived its birth half an hour, in spite of continued artificial respiration and warm bath.

I may mention that chloroform was administered for two hours during the second stage of this labour, which was in a woman of about 35 years; and I think the child's life might have been saved had the forceps been applied when I commenced to give chloroform, and the labour finished sooner. My reasons for not applying the forceps were the absence of the lady's husband, the urgent request of her friends not to do so, and the fact that the head was slowly advancing, though very slowly.

One child was born at seven months, and was only made to breathe after artificial respiration and baths were kept up for 90 minutes, and only survived four hours. In this case also chloroform was given throughout the second stage, which lasted about two hours. As far as I can trace the remaining 24 children, they are all alive, with two exceptions, viz., one boy, who died of acute hydrocephalus at two years old, and one girl, who died of acute dysentery (?) at sea, aged 15 months.

Of the 19 second labours, all were single births; 18 were natural, and in one the placenta was retained, and had to be taken away. In one case, chloroform was given for about 10 minutes towards the end of the second stage. The 19 mothers all did well, and the 19 children (8 girls and 11 boys) are, as far as I know, all alive, with two exceptions—one boy, who died of acute inflammation of the brain at two years, and another boy, who died of convulsions at eight months.

Of the 11 third labours, all were single births, all were natural. Of the mothers, all are alive save one, who died of phthisis a year after her confinement; and of the 11 children (four girls and seven boys), all are alive except one, who died of chronic dysentery at three and a half years.

Of the nine fourth labours, all were single births and natural labours at full time, with one exception, one labour being at seven months. Of the mothers, all did well, though one was an

epileptic, and had some severe attacks during labour, and another was very much reduced and anæmic, on account of constant uterine hæmorrhage during pregnancy. Of the children born (two girls and seven boys), one girl was still-born at seven months, one boy died at 4 months old from bronchitis, one girl from acute hydrocephalus at 10 months, and, as far as I know, the others are all alive.

Of the five fifth labours, all were single births, and four natural labours. Of the mothers, all are alive save one, who died some months after her confinement, of acute abscess of the liver. Of the children born (three girls and two boys), all are alive. One of these cases had a retained placenta, which had to be taken away.

Of the three sixth labours, all were single births and natural labours; two girls and one boy born; mothers and children all alive.

Of the three seventh labours, all single births and natural labours; three girls born; mothers and children all alive.

Of the two eighth labours, both single births and natural labours; one boy and one girl born; the mothers did well; the girl died at 15 months of spasm of the glottis.

Of the one ninth labour, natural, a girl; both mother and child are alive and well.

Considering these 80 cases together, it is rather remarkable to have met with 80 consecutive cases of single births and head presentations. They show the birth of 33 girls and 47 boys, with only two deaths to children at full time, and two to children born at seven months; they also show the use of the forceps only twice in 80 cases, and of chloroform only six times. I might here remark that I never use chloroform unless specially requested to do so, or I see some special reason for its use, as I am inclined to the belief that it conduces to inertia of the uterus. Of the six cases in which I administered chloroform, three of the children born died, one at full time, the other two at seven months. Concerning inertia of the uterus, I cannot say that I have found any particular tendency thereto here more than elsewhere, there being fair average uterine action in most, if not all, of my cases. I have had no case of postpartum hæmorrhage, though I have attributed this fact to the practice I have of always giving a full dose of ergot just as the head of the child is passing over the perinæum, and using ergot freely should there be any threatening of bleeding afterwards. I have considered myself very fortunate to have so far escaped this unpleasant complication, so common in tropical climates, especially in India; and have always given the hæmostatic properties of ergot the credit of it. To the use of ergot, perhaps, may be attributed the relatively rather frequent retention of the placenta (four in 80 cases) which I have met with, as I am careful to maintain steady pressure over the fundus with my hand till the placenta is expelled. I think ladies living in the south of China may congratulate themselves on the easy process parturition is there, if these 80 cases at all represent the practice of other obstetricians in this part of the world.

Added to these 80 cases, I would mention five miscarriages before three months, and three cases of mole pregnancies.

Of the 78 mothers delivered at full time, 41 nursed their babies the usual nine months, and some of them longer, sorely against my will. I am here speaking somewhat outside of my knowledge, as many of these 41 mothers passed from my care and observation, as they lived on board ships, but they were nursing and able to nurse when last seen. One had plenty of milk,

but preferred to bottle-feed from the commencement; 11 partly nursed and partly bottle-fed their children from the first; two nursed for some weeks and were obliged to leave off, one because there was no milk, and the other on account of breast abscesses. The remaining 23 were unable to nurse at all. My observation leads me to the belief that many of the foreign women *residing* in the south of China are unable to nurse, either on account of insufficient quantity of milk, or of insufficient nourishment in the milk; and this suggests the important question, what is the best way to bring up children when the natural supply of nourishment fails? I cannot go into the subject of artificial feeding here, but would say in passing that some of the finest children I have seen anywhere have been bottle-fed and reared on condensed milk for the first few months, and after on stronger food, varying as each individual child showed a requirement for it. With ordinary care, and more than ordinary cleanliness, I think there is nothing to fear from bottle-feeding, and it is to my mind far preferable to the alternative of employing a native wet-nurse, which is quite as artificial a mode of feeding, and not nearly so cleanly, and far more troublesome and dangerous.*

* Observation in Shanghai does not support the opinion which Dr. Scott has derived from his favourable experience in the South.

F.—Dr. F. Carrow's Report on the Health of Canton for the Half-year ended 31st March 1880.

The health of the port has been very good during the last six months, only the ordinary diseases incident to the climate of South China being presented for treatment. I have, however, had to deal with several cases of ulcerated throat, which in the spring was epidemic here. It was attended with but slight fever, and yielded readily to a gargle of nitrate of silver.

I have had occasion to treat five cases of measles in the half-year just passed, three adults and two children.

Gastric and gastro-enteric fever in children, but not dependent upon the presence of worms in the intestine, has come under treatment. The exacerbations occurred at noon of each day, with but little diminution in the strength of the fever during the rest of the day and evening. There was no very decided remission, but it resembled a continued fever. The symptoms presented were—tenderness over the abdomen, constipation, flatulence, high fever, pulse 140, temperature 103°.8 (daily maximum), and a peculiar scarlet colour at the tip of the tongue and around its edges, while its middle was thickly covered with a yellowish mucus, through which the scarlet papillæ protruded. Slight delirium was noticed, and the disease exhibited a very decided tendency to become chronic. It yielded to quinine and bark, acid drinks, etc., but was very obstinate.

I have to report five births; no deaths.

I am indebted to the Assistant Tidesurveyor for the accompanying meteorological table.

METEOROLOGICAL TABLE.

Abstract from the Meteorological Table for the months of January, February and March 1880; showing Winds, how many Days different directions, with the average hourly Force; Maximum and Minimum of Barometer and Thermometer, also the average Rise and Fall by day and by night; Rainfall during each month; the highest rise of Tide above low-water level, also the average Rise from previous ebb, by day and night.

Month.	Winds.							Weather.			Barometer.				Thermometer.				Tides.	
											Day.		Night.		Day.		Night.		Day.	Night.
	No. of Days N. to E.	No. of Days E. to S.	No. of Days S. to W.	No. of Days W. to N.	No. of Days Variable.	No. of Days Calm.	Average Hourly Force.	No. of Days Fog.	No. of Days Rain.	Rainfall in Inches.	The Highest Reading and the Average Highest.	The Lowest Reading and the Average Lowest.	The Highest Reading and the Average Highest.	The Lowest Reading and the Average Lowest.	The Highest Reading and the Average Highest.	The Lowest Reading and the Average Lowest.	The Highest Reading and the Average Highest.	The Lowest Reading and the Average Lowest.	The Highest Tide and the Average Highest.	The Highest Tide and the Average Highest.
							miles				*Inches.*	*Inches.*	*Inches.*	*Inches.*	*F.*	*F.*	*F.*	*F.*	*Ft. in.*	*Ft. in.*
January..	14	2	...	15	...	...	6.6	4	11	1.0	30.20	30.15	30.19	30.17	61°	53°	57°	53°	3 10	5 0
											30.38	29.99	30.37	29.98	73°	42°	64°	40°	5 6	6 6
February	21	...	1	5	2	...	4.8	15	21	8.1	30.13	30.08	30.13	30.11	58°	55°	57°	54°	4 1	4 7
											30.30	29.96	30.30	29.91	68°	46°	68°	47°	5 6	5 9
March....	14	10	1	2	4	...	3.5	2	4	...	30.17	30.06	30.12	30.09	73°	62°	69°	63°	4 8	4 6
											30.31	29.91	30.28	29.94	83°	53°	76°	50°	6 2	6 5

Remarks.—Rain fell on 9 days, measuring 1 inch, during January 1879. Rain fell on 5 days, measuring 1.6 inches, during February 1879. Rain fell on 13 days, measuring 6.7 inches, during March 1879.

G.—Dr. Alexander Jamieson's Report on the Health of Shanghai for the Half-year ended 31st March 1880.

Abstract of Meteorological Observations taken at the Observatory of the Jesuit Mission at Sicawei, for the six months ended 31st March 1880. Latitude, 31° 12′ 30″ N. Longitude E. of Greenwich, $8^h\ 5^m\ 44.63^s$.

DATE.	Barometer at 0° C.	Thermometer. Diurnal Mean Temperature in Shade.	Thermometer. Extreme Temperature in Shade.	Elastic Force of Vapour.	Humidity.	Ozone.	Velocity of Wind observed hourly.	Mean Direction of Wind.	Total Evaporation during Month.	Total Rainfall during Month.	REMARKS.
1879.	mm.	°C.	°C.	mm. of Mercury.	0-100.	0-21.	Kilom. perHour.		mm.	mm.	
October Max...	770.59	17.20	26.50	19.80	100.0	16.0	38.9	N. 35°.2 E.	66.16	88.2	
October Mean	766.05		—	11.62	78.9	8.9	10.8				
October Min....	756.00		5.00	3.60	27.0	5.0	0.8				
October Range	14.59		21.50	16.20	73.0	11.0	—				
Nov. .... Max...	773.43	12.50	20.00	13.90	100.0	17.0	44.0	N. 29°.9 E.	52.92	57.0	First hoar frost on 11th.
Nov. .... Mean	766.84		—	8.87	81.7	9.8	11.3				
Nov. .... Min....	759.90		1.70	3.00	38.0	5.0	—				
Nov. .... Range	13.53		18.30	10.90	62.0	12.0	—				
Dec..... Max...	774.65	5.42	19.00	10.80	100.0	15.0	70.7	N. 45°.5 W.	57.95	4.2	Violent storm of wind on the 6th.
Dec..... Mean	767.31		—	5.31	76.0	10.5	14.7				
Dec..... Min....	757.28		- 4.50	1.30	28.0	6.0	—				
Dec..... Range	17.37		23.50	9.50	72.0	9.0	—				
1880. Jan..... Max...	779.06	2.54	3.70	7.40	100.0	21.0	44.4	N. 23°.4 E.	38.78	38.3	Slight shock of earthquake on the 11th, at 10.20 A.M.
Jan..... Mean	771.72		—	4.47	80.0	12.6	14.3				
Jan..... Min....	762.91		- 6.80	1.70	28.0	2.0	—				
Jan..... Range	16.15		10.50	5.70	72.0	19.0	—				
Feb..... Max...	776.00	4.30	8.90	8.90	100.0	20.0	52.5	N. 16°.4 E.	28.57	102.5	19 days of rain.
Feb..... Mean	768.74		—	5.55	88.0	13.5	14.6				
Feb..... Min....	761.55		- 1.60	3.40	51.0	8.0	—				
Feb..... Range	14.45		10.50	5.50	49.0	12.0	—				
March.. Max...	775.72	8.60	24.40	13.50	100.0	21.0	56.0	N. 75°.6 E.	66.70	37.4	
March.. Mean	766.92		—	6.81	80.0	13.0	—				
March.. Min....	752.97		- 1.20	2.80	32.0	8.0	—				
March.. Range	22.75		25.60	10.70	68.0	13.0	—				

The above abstract of observations has been drawn up for me by the Rev. Father Dechevrens, S.J. I append as usual three simple rules for reducing the figures to the scales in popular use:—

Rules.

To reduce millimètres to inches, divide by 25.

To reduce kilomètres to miles, multiply by 8 and divide by 5.

To reduce degrees C. to degrees F., multiply by 9, divide by 5, and add 32.

The following return of burials is drawn from the sexton's books and the municipal registers:—

BURIAL RETURN of FOREIGNERS for the Half-year ended 31st March 1880.

CAUSE OF DEATH.	OCTOBER.	NOVEMBER.	DECEMBER.	JANUARY.	FEBRUARY.	MARCH.	TOTAL.
Enteric fever	...	...	*f* 1*	...	...	...	1
Measles	...	...	*f* 1†	...	...	...	1
Asiatic cholera	1	...	...	...	...	...	1
Phthisis	1 *f* 1	...	...	...	...	1	3
Tubercular meningitis	...	1‡	...	...	...	...	1
Dysentery	...	1§	...	...	...	...	1
Bright's disease	...	2	1*	...	...	...	3
Alcoholism	...	...	...	1	...	...	1
Cerebellum, abscess of	...	...	...	...	1*	...	1
Abdominal cancer	1	...	...	...	...	...	1
Bronchitis	...	1	...	...	...	...	1
Cardiac paralysis	...	...	...	...	...	*f* 1	1
Heart, valvular disease of	...	...	1	1*	...	...	2
Liver, acute abscess of	...	1*	1	...	...	1*	3
,, cirrhosis of	...	...	...	...	...	1	1
Chronic diarrhœa	...	...	...	...	...	*f* 1	1
Entrance of air into veins after operation	...	...	...	1‖	...	...	1
Suffocation	...	1	...	...	...	1*	2
Accidental injury	...	...	2*	...	...	1	3
Drowned	...	1	...	1*	...	...	2
Suicide	...	...	1*	1	...	...	2
Uncertified	...	1¶	...	1	...	2	4
TOTAL	4	9	8	6	1	9	37

*Not resident. †3 years. ‡22 months. §11 months. ‖6 years. ¶Portuguese infant.

If we strike out 10 deaths from accidental causes, we have to deal with 27 ascribed to disease. Of these, four occurred among infants, and of the 23 remaining, six were furnished by non-residents. The mortality among adult foreign residents is thus reduced to 17 for the half-year—14 males and 3 females,—as against 12 males and 3 females during the same period of 1878–79.

CAUSES of DEATH from DISEASE among RESIDENT FOREIGN ADULTS, October 1879 to March 1880.

Cholera	1	Pulmonary affections	4 (1 female)
Bright's disease	2	Cardiac ,,	2 (1 female)
Alcoholism	1	Hepatic ,,	2
Abdominal cancer	1	Uncertified	3
Chronic diarrhœa	1 (female)		

CAUSES of DEATH from DISEASE among the CHILDREN of FOREIGN RESIDENTS, October 1879 to March 1880.

Tubercular meningitis	1	Measles	1 (female)
Dysentery	1	Uncertified	1

CAUSES of DEATH from DISEASE among ADULT NON-RESIDENTS, October 1879 to March 1880.

Enteric fever	1 (female)	Disease of heart	1
Bright's disease	1	Abscess of liver	2
Abscess of cerebellum	1		

During the entire hot season, but three deaths were reported from cholera; two in August, and one in October. What the nature of these cases was I have no means of ascertaining, but assuredly there was no such thing as an epidemic of cholera last year; and I adhere strongly to my belief elsewhere expressed* that it is mischievous to affix a dreaded name, always associated with epidemicity, to the sporadic cases of acute gastro-enteritis which occasionally prove rapidly fatal here.† Cholera having been reported as prevalent in Kobé, vessels from that place were, during the ten weeks between the 12th July and 17th September, detained for examination below the shipping. In no instance was a suspicious case found on board any of the ships thus detained, and the arrangements made by the Customs were such that there was no inconvenience or delay experienced. The briefest study of the death returns given above will suffice to show that no epidemic visited the settlement during the period under review. There was no fatal case of small-pox. In this connexion I would note that according to the Report of the Shantung Road Hospital for 1879, the total number of vaccinations performed during the year was 5,129. At the Gutzlaff Hospital, 1,859 children were successfully vaccinated, and at the same time about 150 tubes were distributed to natives for use in the country. Of the two cases of suffocation, one arose from the careless use of chloroform,‡ the other was an ordinary instance of death from inhaling the fumes of burning charcoal. It is noted on the certificate that the abscess of the cerebellum which proved fatal to a patient in the General Hospital in February (the only death, by the way, which occurred in that month) was secondary to inflammation of the middle ear.

The following cases in foreign and native practice present each some points of interest:—

Glandular Tumour of Neck; Operation; Entrance of Air into Veins; Death.—A well-grown male child, aged six years, with excellent family history, several brothers and sisters all living and healthy, had presented during eighteen months a gradual enlargement and induration of the cervical glands on the right side. For two months the enlargement had progressed rapidly, and at the same time the child had presented vague symptoms of failing health, such as irritability, occasional loss of appetite, disturbed sleep, etc. Deglutition had never been interfered with, but within a few weeks there had been occasional attacks of

* *Customs Medical Reports*, xvii, 24.

† In the Report just cited, p. 25, I narrate two cases which I and everybody else would class as cholera did they occur in the course of an epidemic. As these sheets are passing through the press, a case similar though not so severe has fallen under my observation. A foreigner in the prime of life and in perfect health, without assignable cause, was seized with ordinary diarrhœa, followed within a few hours by serous vomiting and purging, with intense thirst, and cramps in the left leg. There was so much restlessness that an accurate thermometric reading could not be obtained. The surface of the body was wet and cold, the tongue and breath cold also. Colourless discharges in painless gushes had continued for two hours when I saw the case. The fluid vomited was alkaline, but this may have been due to admixture with seltzer-water, which the patient had been supping freely but in small quantities at a time. Here, as in the previous cases, the application of mustard and heat, and the administration of morphia and atropia subcutaneously, cut short the symptoms, and convalescence was speedily established.

‡ The verdict of the jury called to serve on the inquest was "that the deceased died from the accidental inhalation of chloroform from a towel placed on his face to relieve neuralgia pains."

dyspnœa, and respiration was difficult, except in a carefully chosen position of the head. The increasing urgency of the symptoms and the child's distress on account of his deformity rendered interference of some kind imperative, and as every imaginable local and general remedy had been patiently tried during many months, without any effect on the progress of the growth, extirpation was the only measure left to be adopted. On the other hand, many considerations seemed to recommend delay, and especially the fact that some six months previously, that is to say, shortly before the rapidity of increase in the neck tumour became strongly marked, the child's waist-girth was observed to enlarge by about 4 inches, and deep palpation detected elastic masses in the abdomen. The process began in the superficial glands, but it was supposed that the deep glands were also implicated. At no time could the mass be raised from its bed, so as to get the finger beneath any portion of it. There was no enlargement of the veins of the face, but the surface of the tumour was covered by a network of engorged vessels. It turned out in fact that, as the result of pressure, the superficial and deep fasciæ, with the intervening platysma and hypertrophied glands were fused into one lobulated mass, whose superimposed elements could not be distinguished from one another, but there was no proof furnished by the operation of any implication of the deep cervical glands. On a final and careful examination, the tumour was found to extend from behind the mastoid process to the clavicle, and probably beneath this bone, and from a point one inch outside the transverse processes to close on the trachea, the anterior portion considerably overlapping the ramus of the lower jaw. In consultation it was decided that the extreme risks of operation were less to be dreaded than the slow and distressing death by which the child was threatened, and removal was therefore resolved upon. An elliptical incision, extending from 25 mm. above the highest point of the tumour to the middle of the clavicle, and enclosing at its widest part about 65 mm. of skin, exposed the tumour sufficiently, and gave ample room. The mass was dissected out from behind forwards, the attachments being carefully stretched on the finger before being severed, and teased with the handle of the scalpel wherever vessels were expected. Every vessel was tied before it was divided, the posterior auricular and external jugular veins being the only large veins seen, but all, great and small, being tied without distinction. Only one large artery was encountered, and this was ligatured in two places and cut between. It was about the size of the adult radial, but I am not certain as to the vessel of which it was a branch. The tumour was found to pass down behind the clavicle, beneath the cervical fascia, but it did not dip beneath the sterno-mastoid, which lay cleanly dissected in the wound. The portion behind the clavicle was drawn into view, its attachments unravelled and divided by gentle twisting and tearing. The sheath of the carotid was not seen, but the finger in the lower angle of the wound was in contact with that vessel and with the subclavian. The operation lasted 35 minutes; about two ounces of blood was lost, and about one fluid ounce of chloroform was used, sprinkled on an open flannel inhaler. Towards the close, the circulation became very weak, but breathing was good. Just as the last attachments of the tumour were separated, breathing ceased, but lowering the head, pulling out the tongue, and artificial respiration re-established it immediately. Chloroform had been withdrawn for some minutes, and one point of suture had been inserted, when, on piercing the skin for the second stitch, the child gave a deep inspiration, there was a faint hissing sound, the lower bowel was emptied, face and lips became blue, and breathing stopped altogether. Meanwhile the child had been surrounded with hot bottles, the window was thrown open, and artificial respiration was begun. This was kept up for 15 minutes, but the wide dilation of the pupils from the moment that the hiss was heard showed that death had occurred at that moment. The weight of the tumour was not exactly ascertained, but it was about 1.33 kilo.

It is possible that chloroform was withdrawn a little too soon, for had the child been insensible to the needle puncture, the deep inspiration, which seemed to have displaced an imperfectly formed clot, would not have occurred, or would have been postponed until after the vessel concerned had been more securely sealed. This vessel must have been a very small one, considering that there had been no bleeding from it, and that it had escaped observation. We

ascertained after death that all the ligatures placed were still undisturbed. Its insignificance in point of size was compensated by its nearness to the great venous trunks of the chest, and its exposure to the suction action of the right heart. But the chloroform was a danger in itself, and having seen that it was beginning to be badly borne, I was anxious to withdraw it as soon as possible. Indeed, here it was a choice of dangers, as from the first there had been a choice of evils.

Fibro-sarcoma of Upper Jaw; Operation, with Preservation of Infra-orbital Plexus; Recovery.—A Chinese woman, aged 40, was admitted to the Gutzlaff Hospital on the 1st January 1880. For the past three years she had been sensible of an enlargement of the left superior maxilla, with severe neuralgic pain radiating over the entire left side of the face, and lately œdema of both eyelids, and epiphora. What, however, gave her most distress was the progressive destruction of the palate, the left side of which was occupied by broken-up bone and a soft ulcerating mass, which continually filled her mouth and fauces with bloodstained mucus of very offensive smell. For several weeks she had been unable to sleep for more than a few minutes consecutively, a feeling of suffocation rousing her as soon as the discharge collected in the throat. From this cause, and from inability to eat, she had wasted considerably. On examination, the palate was found to be as described. Division of a few bridles of mucous membrane exposed the greater portion of the palate process lying dead and loose. This was removed, and thereby a measure of relief was afforded, sleep for longer periods being at all events rendered possible. The cheek was deformed to the size and shape of a mandarin orange, the left eye was protruding slightly, and sight was beginning to fail. The left nostril was blocked by the tumour, which seemed to have pushed the middle and inferior turbinated bones and mucous membrane into contact with the vomer and perpendicular plate of the ethmoid, but without invading their tissue. Excision having been proposed and accepted, no difficulties were encountered in the operation. An incision from the internal canthus to the middle of the upper lip enabled the cheek to be lifted without trouble, and the entire of the tumour was easily exposed to view. The only point in the operation worthy of notice was the careful isolation of the infra-orbital plexus, which was dissected up along with the cheek to the border of the foramen, where the trunk of the nerve was isolated. A fine saw was carried round it, and the incision followed the circumference of the orbit from the nasal process to the maxillary process of the malar bone. The maxilla was then loosened in the usual way and twisted out with lion forceps, the palate bone, which was equally involved in the tumour, coming away with it. The edge of the orbit was thus preserved along with the nerve, but the orbital surface of the bone accompanied the tumour, leaving the under half of the eye exposed. No vessels were tied. The cavity was stuffed with boracic lint, and recovery was uninterrupted. On the eighteenth day the patient left the hospital at her own request, when the following note was made:—"Very little distortion of face; cavity about one quarter its original size, and lined by exuberant vivid granulations; right maxilla seems much pulled over to left side; no wasting of cheek; complete command over facial muscles; cutaneous sensibility intact." Six months after operation there is no threat of recurrence.

The tumour was found to involve the entire of the left superior maxilla and left palate bone, except the dense ridge at the border of the orbit. To the naked eye it appeared to be a soft fibrous growth, probably originating in the antrum, which was completely obliterated. The anterior bony surface had been to a great extent absorbed, leaving the tumour in the form of a homogeneous, elastic mass, rudely preserving the original shape of the bone. It contained no cysts. On microscopic examination of sections from different parts, it was found to consist of short fibres with plentifully interspersed nuclei, but I could find none of the oat-shaped nucleated cells upon which Paget lays stress as prognostic of recurrence.

I am, however, far from certain that the growth will not recur. Meanwhile the general health has been re-established, and life has become once more enjoyable. The plan of preserving

the infra-orbital plexus is due to M. LETIÉVANT, who recommended it in 1876 at the annual meeting of the *Association française pour l'Avancement des Sciences*, and supported his recommendation by cases. In the instance just narrated, and in one other in which I operated in accordance with M. LETIÉVANT'S views, the result as regards preservation of the form of the face, muscular power, and sensibility was distinctly better than in the few other cases in which I have been called on to remove the upper jaw.

Scrotal Hernia, rendering Patient unfit for work; Wood's Wire Operation; Cure, with Development of Hydrocele.—A middle-aged native was admitted to the Gutzlaff Hospital with a right scrotal hernia of long standing. His business compelled him to be on his feet for several hours daily, and shortly after beginning work each morning the bowel formed a protrusion as large as two fists. Reduction could always be easily performed as soon as he lay down. He was very despondent about his condition, and constantly suspicious of those around him, fancying that they were ridiculing him, plotting against him, and circulating abominable stories about him. His bowels were sluggish, and he suffered much from internal piles, losing considerable quantities of blood from time to time. Could not get a truss to fit him. After reduction, the canal admitted two fingers easily, the edges of the external ring being sharply defined. WOOD'S operation by wire was performed, no particular difficulty being encountered. Although 35 mgr. of morphia was injected subcutaneously immediately after the operation, he shortly became very restless and complained of much pain. He then confessed to being an opium-smoker, whereupon 50 mgr. was injected, and he was allowed 2 fluidrachms of laudanum daily. On the third day he was attacked by pneumonia on the right side, which ran an acute course, and terminated in 10 days. During most of this time he took milk congee freely. There was no belly tenderness, but the cough caused much distress, and severe pain in the wound and its neighbourhood. On the fifth and seventh days castor oil was given. On the ninth day the wires were untwisted and cut. The canal was occupied by a firm mass, but there was a good deal of discharge. The scrotum was much swollen. On the eleventh day the wires were withdrawn, and from this out convalescence, though very slow, was uninterrupted. By the thirtieth day the wounds were completely healed, and there was no tendency to protrusion on forcing a cough in the erect position. Two days later it was noticed that the testicle was swollen. The swelling increased gradually for a week, when puncture gave issue to about 5 fluidrachms of serum. The patient refused to allow iodine to be injected, and the sac refilled to its size previous to puncture, when it became stationary. Six months later the condition of affairs was unchanged.

In five cases (among males) of delusions of persecution which during the last few years I have had under observation (two of them terminating by suicide), hernia was present. This is perhaps merely an accidental coincidence. It is worth noticing, however, that the patient whose case is related above lost all his suspicions after his cure. Whether in this respect recovery was permanent I cannot say.

Scirrhus of Breast; Extensive Infiltration of Axillary Glands and Pectoral Muscles; Operation; Favourable Progress; Epilepsy; Death.—A native woman, aged 43, was admitted to the Gutzlaff Hospital with a tumour of stony hardness occupying the right breast, the skin covering which was purple, shining, and traversed by large veins. There was no ulceration, but the tumour was firmly adherent to the chest wall, and at its superior and external angle extended along the great pectoral, and filled-in the axilla. The patient stated that she first noticed a small, well-defined lump on the inner part of the gland three years ago. The nipple was now very prominent and irritable, covered with a weeping eruption, and fissured in several directions. She was confident that the nipple was not affected in any way until long after she first noticed the tumour. Her general appearance was healthy. Her object in seeking operation was to obtain relief from the inconvenience caused by the size and weight of the growth. It was only within a few weeks, and long after resolving to have the tumour removed, that she had suffered from occasional paroxysms

of violent pain in the right arm and right side of head and neck. The breast was removed by an elliptical incision through healthy skin. A very large portion of the great pectoral was cut away, leaving the periosteum of the ribs exposed in one place over a space larger than a dollar. The infiltrated muscle was followed up to the humerus, and every portion that appeared in any way suspicious was removed. A mass of axillary glands was enucleated with the fingers. All the vessels were twisted, and no attempt was made to draw the edges of the wound together. Immediately after the operation the wound measured 24 cm. in greatest length by 11 in breadth. The first dressing was changed after 48 hours. The wound had already contracted considerably, and was looking quite healthy. The general condition was reassuring. The temperature had not risen above 38° C., appetite was fairly good, and although the night after the operation had been disturbed, the succeeding night had been excellent. On the morning of the sixth day, the woman sat up in bed to eat, and rose to take a turn round the ward on the seventh day. On the eighth day, as the wound was about to be dressed, she complained of feeling fatigued, and asked to be left till the afternoon. Half an hour afterwards she was found in an epileptic fit, became comatose, and died. On inquiry from her husband, it was ascertained that she had been epileptic from her youth, attacks occurring on an average twice a month.

When inquiring into this woman's history, I did not think of asking whether or not she was epileptic; and I do not suppose that knowledge of the fact would have influenced me in deciding the question of operating. ECHEVERRIA* remarks on the immunity usually enjoyed by epileptics from the dangers incident to extensive wounds, operative or other; but here it was not the effect of the latent epilepsy on the wound or on the general condition which had to be noted, but the effect of the wound on the fatality of the next occurring epileptic paroxysm. It is not certain, but it is probable, that but for the enfeeblement which followed so extensive an operation, this apparently healthy woman of middle age would have got through her attack on this occasion as she had done on innumerable previous occasions. On the other hand, it is possible that the operation had nothing to do with the event. But, bearing this case in mind, it would seem wise to avoid any operation not urgently called for in epileptics, and at all events to make previous epileptic seizures the subject of inquiry in all instances. Had I done so in the case just reported, I would have dosed her largely with bromide of potassium before the operation, and up to the complete closure of the wound; and it is reasonable to suppose that this treatment might have postponed the occurrence of an attack.

Enormous Hypertrophy of Clitoris; Removal by Écraseur; Cure.—A married woman, aged 32, with one child four years old, presented herself at the Gutzlaff Hospital with a pyriform tumour, not sensitive on being touched, covered with rugous skin, ulcerated here and there, which occupied the vulva. She was positive that the growth was not congenital; she had noticed it for the first time shortly before the birth of her child, and it had progressed slowly and painlessly ever since. For several months she had been obliged to carry it in a suspender, but even with this device, the standing posture gave rise to agonizing pain down the interior surface of the thighs. This pain and the distress and annoyance caused by the tumour led her to seek advice. She had already, it should be remarked, swallowed the value of several hundreds of dollars in the shape of native internal remedies. On examination, the left labium majus was found involved in old inflammatory thickening caused no doubt by the constant irritation kept up by the tumour. The right labium was free. The dragging had deformed the parts very considerably. The left nympha, except for its anterior half, looked healthy. A circular incision, embracing the pedicle about 6 mm. above its attachment, was carried through the altered mucous membrane, and two small flaps dissected. The diameter of the pedicle was about 30 mm. This was divided by the steel-wire écraseur, without any

* *Archives Générales de Médecine*, 1878, ii, 673.

loss of blood, and the flaps laid over the stump and united by two points of suture. Union was immediate, and the parts resumed their natural appearance after a few days. The tumour was dense and fibrous on section, and weighed 1,270 grammes.

In this case there was no suspicion of syphilis, and a careful examination of the woman's throat, skin, neck and groins failed to afford any evidence of such taint. Authorities, while admitting that these growths arise independently of syphilis, refer most cases to this as cause. The affection is, I think, of very rare occurrence among the Chinese. During 11 years of constant surgical practice at hospitals for natives, I have seen but this one instance of it.

Medullary Cancer of Cervix Uteri; Enlargement and Fixation of Uterus; Profuse Hæmorrhage; Operation; Favourable Result; Accidental Complication; Death.—A Chinese woman, aged 34, was seen in private. For eight months she had suffered from severe losses, with little or no pain. Latterly, hæmorrhage was profuse, and was excited by the slightest movement. When bleeding was not present there was a constant watery discharge of faint odour and slightly coloured, which excoriated the skin. For the past month she had been confined to a couch, where she lay doubled up, as even stretching the legs produced bleeding. Frequent calls to micturate interfered with sleep, and appetite had almost disappeared. On introducing the finger into the vagina, a mass, soft in portions, but generally elastic, was encountered at a distance of about 5 cm. This filled the canal, but with some coaxing the finger could be got behind it, and then carried completely round it. Above it, and level with the roof of the vagina, was a narrow zone which seemed free from disease. The body of the uterus, smooth but hard and enlarged, could be felt behind the pubes, and though it was difficult to make out this point exactly, it appeared to be fixed. Examination by the rectum was very painful. Movement could not be imparted to the uterus from it, but the anterior wall was free as far as the finger reached. Very severe hæmorrhage followed the examination, but was arrested by the application of perchloride of iron lint to the ulcerated surfaces, and the introduction of a sponge wrung out of a 5 per cent. solution of carbolic acid. The latter was removed the same evening, and bleeding did not recur until next day, when, on moving from the couch, half a large chamber-pot of blood was lost, and alarming syncope came on. There were two enlarged but indolent glands in each groin. The local condition and the general state opposed any idea of operating. On the other hand, the woman's condition was desperate and could not be made worse by any treatment. She urgently demanded operation, and as it was at least possible that the disease was still limited to the cervix, it was undertaken after a full acceptance by her of all the risks. She was accordingly removed to the Gutzlaff Hospital. Having been chloroformed, the steel-wire of an écraseur was with great difficulty got into position above the mushroom-like mass presented by the tumour, and an attempt made to draw the uterus down, which failed completely. Moreover, on account of the angle at which the loop was bent, the tube of the instrument could not be brought into contact with the part which I wished to divide. The wire was therefore removed, and the vagina, the lower portion of which was now filled with clots, bleeding having been very severe during this fruitless manœuvre, was plugged. Chloroform was withdrawn, and about an ounce of brandy administered. The zone previously occupied by the wire was now pierced from side to side, at points as nearly equidistant as possible, by three of Davis's hernia needles, whose points were then capped, a matter of very great difficulty. A stout piece of tape was got above these, and drawn as tightly as possible, bringing the uterus down perhaps a very little. The entire mass occupying the vagina was then cut away with a stout probe-pointed, curved bistoury. The traction on the tape immediately pulled the needles through the edges of the stump, and I feared a terrific hæmorrhage. Nothing of the kind occurred. The vagina was syringed out with hot water, and the largest size glass speculum was introduced. Three vessels were seen smartly spouting, but were fortunately caught, and their orifices touched with a fine pointed iron at a low red heat. There was slight oozing, which soon ceased. The surface of the section, which looked healthy, was then dressed with pledgets of dry iron lint, and the vagina was tightly plugged with strips

of lint wrung out of a warm solution of carbolic acid (about 1 per cent.). The operation was performed on the 14th September 1879. The bladder irritability ceased immediately, urine having been passed only once during the following night. There was no pain; the patient slept well (35 mgr. of morphia subcutaneously), and next morning the temperature was 38°.7, rising to 39° in the evening. On the morning of the 16th (temperature 38°), the lint was withdrawn, the iron lint remaining. It was hardly stained. Appetite had returned, and milk and rice, with mutton broth, were taken freely. On the 20th she ate some fish, and this day the iron lint came away. Meanwhile warm injections of CONDY'S fluid were used three times daily, although there was hardly any discharge, and that not offensive. The recumbent position was constantly recommended, and it did not seem likely that she would disobey. Colour had returned to the lips, and the general appearance was excellent. The bowels were opened by enema on the 20th, as colic was complained of. On the 22nd, while left by herself, she rose and arranged her hair, sitting by an open window. She got cold, and the evening temperature was 39°.5. A dose of quinine and compound ipecacuanha powder got her out of this scrape, and next day she was well again. But, unfortunately, she had been allowed to have her own servant to wait on her. This woman, during the dinner hour on the 24th, brought two buckets of cold water into the private room occupied by her mistress, and assisted her in taking a cold bath. That night I was sent for, as she was thought to be dying. She was unconscious, tossing from side to side; temperature in the rectum 41°. She could not be got to swallow. An enema of 1.5 gramme of quinine was retained, and was repeated after six hours. On the morning of the 25th she was conscious, told what she had done, and expressed her conviction that it was now all up with her. Her temperature was 40°. She insisted on being removed to her home, but was persuaded to stay. Next day (26th) she was so importunate to be removed that she was permitted to go, and she died the same afternoon.

The mass removed presented no trace of the healthy tissue of the cervix, except here and there, supposed to be in spots answering to the surface of section. It was impossible to reconstruct the tumour from the pieces. Certain portions were reduced to a pulp, which when evacuated left more or less cleanly excavated depressions, on the surface of which the lumina of vessels were distinct. The firmer portions showed on section a fibrous mesh enclosing nucleated cells, chiefly circular and oval, with here and there a brilliant nucleolus. Circumstances prevented the microscopic examination from being very minute.

The immediate cessation of hæmorrhage after the operation was remarkable and unexpected. I am satisfied that but for the patient's obstinacy she would, at least for a time, have recovered health and strength, though what her ultimate fate would have been is doubtful. It was fortunate that the écraseur did not work. The section left after the tumour was removed was flush with the roof of the vagina, and it is well known to all surgeons familiar with the écraseur that it removes in reality much more than it has the air of removing. The cavity of the abdomen would have been opened, I have no doubt, had the first attempt succeeded, and although SIMS was once lucky enough to get a recovery after this accident,* such good fortune is not to be counted on.

Pyæmic Abscesses of Liver (8); *Aspiration of Two; Temporary Relief; Death.*—A stout, well-built foreigner, aged 36, long resident in the East, confessing to having been a free liver, had had dysentery a few months before coming under observation, and had never got quite rid of it, though it alternated with obstinate constipation. When I saw him he was deeply jaundiced, and his chief complaint was of constant vomiting. There was no dyspnœa. The surface was cold (temperature in the mouth 35°.8 C.), the pulse was 126, small and compressible. Tongue dry; no delirium; no history of rigors. He could lie equally well on both sides, and suffered from no pain. Liver dulness extended from the nipple level to a line drawn across the body 5 cm. above the navel, and extended 12½ cm. into left hypochondrium. Behind, the lung

* *Clinical Notes on Uterine Surgery*, p. 202.

was hardly, if at all, encroached on. There was tenderness on percussion at a point a little to the right of the middle line, and 2½ cm. below the costal border. Here obscure fluctuation could be made out. Urine, scanty and high coloured; no albumen. Vomiting was partly controlled by hydrocyanic acid internally, and subcutaneous injections of morphia, so that a little iced milk and soda-water, chicken broth, or brandy and water was from time to time retained. A castor oil enema brought away a quantity of brown-black scybalæ, and afforded a good deal of relief. Next day the temperature was normal, both morning and evening; fluctuation was very doubtful, and there was less local tenderness. Champagne and hard biscuit were retained. On the following morning all the symptoms were aggravated, there was total loss of appetite, inability to sleep, and great restlessness. I introduced an aspirator needle at the point previously marked, and withdrew 75 grammes of thick yellow pus, mixed with a little blood. Relief was immediate; the patient asked for some food, ate a biscuit and drank a glass of champagne, and slept for three hours in the afternoon, waking in a bath of perspiration and very cold. He was rubbed dry, a hot bottle put to his feet, and he chatted cheerfully with some friends. Next day he had relapsed into his former condition. An enema was again administered, and 25 grammes of pus, now largely mixed with blood, was withdrawn at a point 3 cm. from the former puncture. From this out he sank rapidly, and died 12 hours later.

The liver was alone examined. The left lobe contained two abscesses, both superficial, one about the size of an orange, the other that of a walnut. The right lobe contained four, exclusive of the two which had been evacuated. Of the four, three were deeply placed, and one was almost in contact with the peritoneum, a little in front of the axillary line, and immediately behind the lower border of the false ribs. The needle tracks were visible, but there had been no escape of fluid along them. There was no ascites.

Cancer of Kidneys and Liver.—A man, aged about 45, engineer of a steamer, many years resident in China, and much broken down by excesses of various kinds, suffered during the early part of the summer of 1879 from frequent attacks of vomiting, often accompanied by dysenteric symptoms. The nausea was capricious, coming on sometimes immediately after eating, at other times being absent for several days. So also there would be occasionally, for two or three days at a time, eight or ten passages containing mucus and blood, with little or no fæces, and then for a day or more there would be solid stools, always very dark in colour. The tongue was generally white, with red tip and edges, but was occasionally dry and fissured, without there being at the same time any increased bodily heat. The temperature under the tongue, in fact, varied between 36° and 37° until the day before death, when it remained at 35°. The patient never suffered any pain, was not at all anxious about his condition, and remained on duty up to 10 days before his death. His general appearance was suggestive of malignant disease. There was nothing to be discovered in the chest. The urine was scanty (about 800 cc.), very frequently voided, contained a trace of albumen, no sugar, specific gravity 1.011 to 1.018. The liver was small, the upper limit of dulness normal, but the lower limit in the mammary line was at least 3 cm. above the costal margin. Posteriorly, the entire surface was dull on percussion from the tenth dorsal vertebra downwards. Nothing could be made out by palpation. The glands in the inguinal region were hard, somewhat enlarged, but indolent. Ten days before the man died he laid up, and from this out, the quantity of urine voided rapidly diminished, until on the fifth day the secretion was completely arrested. Three days later, vomiting and diarrhœa ceased spontaneously, and for two days the patient remained perfectly quiet, though not sleeping, rather dull as to intelligence, but able to dictate his will and letters to his family, taking a little iced milk from time to time, perspiring very profusely, but presenting no urinous smell on his breath or from his skin. On the morning of the sixth day after the cessation of the urinary secretion, or, more accurately, 117 hours from the time of the last discharge of urine, he became comatose, and died in two hours.

At the *postmortem*, the heart was soft and small; the lungs were healthy, but slightly emphysematous at apices. The stomach was the seat of a simple chronic inflammation; the mucous surface of the intestines was healthy, except in the rectum, which was chronically inflamed throughout its whole extent, and the lower 15 cm. of the ileum, which was scarred and puckered, and diminished in calibre by about one-fourth, the traces of long past ulceration. Pretty generally distributed over the peritoneal

surface were minute pigmented granules of cancerous nature. The liver was finely nodulated, or rather granulated, on the surface, contracted, weighed 1,566 grammes, was adherent to the diaphragm, and cried under the scalpel. Close to the edge of the right lobe were four hard nodules, occupying the whole thickness of the organ. They were easily shelled out, and when cut and squeezed exuded a milky fluid. Sections from several portions of the liver were examined microscopically, but nowhere was unaltered liver tissue found. In the neighbourhood of the nodules, the fibres of the condensed connective tissue were occasionally separated from one another by collections of cancer cells, but between these collections, and between them and the fully-formed nodules, the connective tissue, with its characteristic cells here and there unaltered, betrayed no sign of the neighbourhood of cancer. There was thus no general or extensive infiltration, nor were nodules found anywhere else than in the limited region just mentioned. The hepatic cells were darkly pigmented, and seemed to be enlarged, but at the moment I had no normal section at hand for comparison. The biliary ducts were irregularly dilated, as I believe they always are in cirrhosis. The gall-bladder, the two trunks of the hepatic duct, the cystic and common ducts were all contracted, but otherwise appeared healthy. The right kidney weighed 245 grammes, and consisted of a soft brain-like mass in which none of the proper renal tissue could be discovered. In the centre was a cavity as large as a small walnut, containing detritus and a yellow fluid. The left kidney was small, hard, and nodulated on the surface. On section, about two-thirds of the gland was found occupied or replaced by a medullary growth, the remaining third and the pelvis being seemingly unaffected. The right ureter was contracted, so that an ordinary probe failed to pass into it from above; the left ureter was of natural appearance and calibre. The bladder was empty and firmly contracted. The abdominal cavity contained about 500 cc. of faintly tinged serum. There was no anasarca.

The absence of more marked uræmic symptoms, in spite of anuria persisting for so many days, may probably be explained by diminished production of urea, and this, in turn, by the condition of the liver. The case is interesting, and even important, as illustrating the views of those physiologists who consider the liver as the seat of urea formation. It is also interesting as an instance of the relations which bind together the kidneys and liver, relations which, from the pathological side, are most frequently illustrated by the liability of all three glands to the simultaneous occurrence of cystic degeneration.

Aphasia (Temporary) with Left Hemiplegia; Improvement.—A civil mandarin, aged 57, came under observation last October. He was short and spare, but strongly built, and stated that he had always enjoyed excellent health. Married at an early age, he had never suffered from any venereal affection. For many years he had occupied posts of great responsibility, the anxieties attaching to which had constantly interfered with his rest and sleep. Ten months previously he was particularly harassed by work, and had passed several sleepless or nearly sleepless nights in succession, but had noticed no other symptoms of impending illness. He was about to finish up his immediate cares by a dinner with the Viceroy of one of the southern governments, at whose residence he was staying, when, just as he was seating himself, he complained of feeling ill, immediately lost consciousness, fell to the ground, and was carried directly to bed. There were no convulsions. Next morning it was noticed that his mouth was dragged to the right, and that his left side was powerless. "After a few days" consciousness returned, but he was speechless, confused in his mind, and from time to time showed much mental distress, without apparent cause. "Gradually" he began to use single words, sometimes incorrectly, but usually correctly, until "after a few tens of days" he could speak as well as ever, and had lost his exaggerated emotional sensibility. He was able to write down what he wanted before he quite regained the power of asking for it verbally. He could often, but not always, understand what was said before he became able to write. At first he swallowed with difficulty, but this condition "soon" disappeared. Presently he began to transact business as usual.

About three months after the attack a certain amount of power was regained in the left leg, so that he could walk with the aid of a man supporting him. It was then first noticed that the fingers of the left hand were forcibly flexed into the palm.* This contraction went on increasing, until "at the end of four months," whenever the hand was left to itself, the thumb was flexed into the palm, the fingers over the thumb, and the hand on the forearm, which was pronated. From the first there had been severe pain on the left side of the head. Of late this had become more severe but less continuous. There had also always been a great deal of toothache. (Both these pains were perhaps due to a carious left lower first molar). Appetite good, sleeps well for about five hours every night, has a healthy motion every day. Urine natural in appearance and quantity. His memory is perfectly good, and he daily transacts an enormous amount of public business involving much writing. About a month previous to my seeing him, he was attended by the native assistant at a foreign hospital, who ordered him some foreign medicine which made his entire body twitch. He took two bottles of this, with an interval between, but it made his headache worse, and seemed to tighten the contraction of his hand.† Ever since the attack he had been taking ginseng on his own account. With the exception of the twitching induced by the foreign medicine, his condition had not sensibly changed for four months.

This was his story as told by himself, his friends, and a confidential servant who had witnessed the attack and had attended him constantly since it. It leaves much to be desired in precision as to the phenomena attending the attack, the order in which subsequent symptoms appeared, and the intervals that separated them. The date of the appearance of exaggerated tendon reflexes had, of course, passed unnoticed. After examination the following notes were made:—

Two attempts at ophthalmoscopic examination failed, partly through difficulty about light, partly because I did not wish to frighten the patient by interfering with his vision, and therefore attempted to explore the fundi without dilating the pupil, but chiefly in consequence of the patient's nervousness about the proceeding. The general appearance was that of good health. The folds of the skin of the face were more marked on the left side than on the right, but when the patient spoke or laughed, the healthy muscles on the right side overcame the slight contracture, and flattened the paralysed side. The tongue was protruded nearly straight, with a trifling deviation of the point to the left. Its movements were quite unrestrained. The paralysed limbs were very slightly, if at all, wasted. The left hand was colder than the right, but the skin of the arm, leg and foot (covered) was sensibly the same as on the right side. The pulse at the left wrist was perceptibly smaller than at the right. The superficial arteries were apparently healthy. The heart was healthy; there was no cough, and a very minute examination of the lungs failed to reveal any mischief anywhere. Urine, specific gravity 1.018, faintly acid, contained neither sugar nor albumen. The patient was not left-handed, nor had he either in childhood or adult age shewn any tendency to use his left hand with unusual freedom or frequency.

The left arm in repose was closely applied to the side, but was fairly movable from the shoulder-joint. It could be rotated, and moved backwards, forwards, outwards, and inwards, but could not be raised vertically. The forearm and hand were as above described. The fingers could be voluntarily unclosed to a very slight extent, and still farther, but not at all completely, by the aid of the other hand. It was as

* Contracture usually presents itself about the middle of the second month. VULPIAN relates a case wherein it appeared on the twentieth day.

† This was no doubt strychnia. It has long been known that "after the administration of nux vomica, paralysed persons exhibit a notable stiffness of their affected limbs, which persists, although the use of the drug may have been long suspended." (FOUQUIER: *Mémoires de la Société de la Faculté de Médecine*, 1820; quoted by CHARCOT in his lectures at the Paris Faculty, session 1879–80.) The tendency to exaggerated tendon reflexes antecedent to and contemporaneous with post-hemiplegic contracture is greatly increased by strychnia, which hastens the progress of events in a very marked manner.

difficult to exaggerate the flexion of the wrist as to overcome it. The patient was unable to walk, but could stand for a minute or so unsupported, and whether his eyes were open or shut. The left foot was in forcible extension. By an effort he could place it nearly flat on the ground, but could not keep it so. When sitting he could push forcibly with the heel. There were occasional startings in the leg muscles. WESTPHAL'S patellar tendon reflex was present on the right side, and greatly exaggerated on the left. The *Fussphänomen* (ankle clonus) could not be elicited on the right side. But when I hung the left leg over my hand supporting the ham, and suddenly lifted the point of the foot, a series of muscular shocks so violent was produced that the patient and his friends were seriously alarmed, and I did not care to repeat the experiment. The voluntary act of putting the foot to the ground, which, of course, was always performed slowly and gently, never produced any of these symptoms of spinal epilepsy.

Cutaneous sensibility was equal and normal in both arms. In this respect there was but little difference between the two legs. The æsthesiometer points were felt as two at 37.5 mm. apart all over the outer surfaces of both, and at 35 mm. apart on the inner surfaces. Occasional formication was complained of in the left arm and leg, but chiefly in the leg.

He was ordered a mixture containing iodide and bromide of potassium with iron and quinine, and a generous diet, with port wine. The hollow tooth was kept plugged with cotton wool soaked in creasote.

A week later, when seen again, he was free from headache. The condition of the arm was unchanged, but the leg was so far improved that he could walk the length of a moderately sized room (about 6 mètres) without support. The æsthesiometer points could be distinguished at a distance of 22.5 mm. on the inner surface of the left leg. After another week there was a further increase of sensibility on both sides, the points being distinguished at 15 mm. He walked more steadily. There was no change in the hand, except that when lying down and warm in bed, he noticed that he could open it farther than before or than when he was sitting up. But this had probably been the case all along, and had merely escaped observation.

The patient now left Shanghai, but was seen one month later, and again after six more weeks. There had been very little further improvement, if any, except in the power of walking. This continued to increase, in consequence, I think, of a general improvement in health, due to careful and liberal diet, tolerably free use of wine, and diminution of work.

II.—Dr. P. Manson's Report on the Health of Amoy for the Half-year ended 31st March 1880.

The health of the foreign community during the six months has been unusually good. Very few cases of serious sickness have occurred, and I have to record but one death. There has been no epidemic of importance either among foreigners or natives, and the usual spring small-pox epidemic has passed over very lightly.

The death referred to was caused by abscess of the liver. Though the case terminated in November, the disease was acquired during the previous six months, the first symptoms having appeared in July.

I.—Dr. J. G. Brereton's Report on the Health of Chefoo for the Half-year ended 31st March 1880.

Abstract of Thermometer Observations.

Month.	Highest.	Lowest.	Average.	No. of Days Rain or Snow.	Month.	Highest.	Lowest.	Average.	No. of Days Rain or Snow.
1879.	°	°	°		1880.	°	°	°	
October	74	40	57	4	January	41	13	27	5
November	64	29	46	2	February	45	14	29	5
December	58	20	39	5	March	69	22	45	4

The lowest reading was 13°, being 3° higher than during the corresponding period last year.

The winter, on the whole, was comparatively mild; the health of the foreign community being at the same time exceptionally good. There was almost a complete absence of serious affections; cases of ordinary catarrh, associated in some instances with bronchitis, occurred, however, not infrequently, but these were generally traced to undue exposure, and are liable to take place in any climate. During the latter part of the winter, or early spring, many individuals remarked a wonderful development of electricity in the air. During the operation of dressing the hair, in some instances large sparks of electricity were quite visible, but it has not been yet determined if an electrical condition of the atmosphere has any effect upon health or disease. Very little snow fell during the winter, and severe storms were infrequent, so, instead of having bitterly cold storms, as is usual during this season, we have had fine, clear, bracing weather, which imparted a sense of vigour and inclination for daily exercise. This latter was indulged in to a considerable extent, and I have no doubt contributed not a little to the general good health of the community.

During the period under observation there were four births and one death.

One of the labours was the most severe which has taken place in Chefoo for a considerable time. The labour pains were not at all strong. In fact, it was what is generally known as a "tedious" case. Presentation natural. About nine hours after the beginning of the second stage it was found that the head was impacted at the brim. Barnes' long forceps were applied. Subsequently chloroform was administered, as the pain produced by the effort at delivery was not well borne. Gentle traction on the blades of the forceps, which were applied over the parietal regions of the child's head, did not make the slightest impression. Increased force only caused the instrument to slip. After two or three attempts, the patient was allowed to recover from the effects of the chloroform. She then rested quietly for a couple of hours, when the pains returned slightly. Inability to urinate now set in, the vagina at the same time becoming dry, hot and sensitive; consequently I determined to deliver at once by forceps, or, failing in this,

to resort to craniotomy. Chloroform was given, the catheter was passed with difficulty, and the instruments again applied. They slipped as before whenever much force was used, but they were re-applied each time they slipped, and after about 35 minutes the head was found to yield tardily, and finally was brought down to the perinæum. At this stage I replaced the long forceps by CHURCHILL's short forceps, which I found to act admirably, and enabled me to deliver the child without very much further trouble. Some difficulty, however, was experienced in completing delivery of the body, as the child was very large, but healthy and vigorous, and exhibiting no mark or abrasion from the instruments. Considerable hæmorrhage set in immediately after delivery, to check which a hypodermic injection of ergotin was given, but was not of any service. The hand was then introduced into the uterus in order to extract the placenta, but, owing to the irregular contractions of the organ, this was accomplished with considerable difficulty. The patient ultimately made a good recovery.

The other confinements were perfectly natural and progressed satisfactorily.

The death alluded to occurred in a child two months old, from pneumonia.

The only case of zymotic disease among the foreign community was a mild case of measles in a young child; but many children in the adjacent villages were attacked with this affection. The young native population in the vicinity of Chefoo have suffered somewhat also from an invasion of whooping-cough, illustrating the relation which exists between these affections, one disease sometimes preceding the other, sometimes following. In this instance, as far as could be learnt, the whooping-cough preceded measles. The mortality was not great. Shortly after the subsidence of measles, many of the natives were attacked with inflammatory sore throat, attended with, in some instances, exudation of false membrane, thereby simulating true diphtheria, the temperature running as high as 103° or 104°. Some of the families attacked lost two or three of its members, while others were more fortunate. I did not meet with any case of paralysis or other sequelæ of diphtheria. It will thus be seen that however healthy the season has proved to foreigners, the natives have suffered rather severely.

NOTES ON SPRUE.

By Patrick Manson, M.D.

There is a multitude of diseases peculiar to tropical and subtropical countries to which the inhabitants are liable, and which foreigners may acquire when exposed to the corresponding morbid causes. There is another class of diseases peculiar to these countries, attacking foreigners only, and but seldom, if ever, affecting the natives. Notably, tropical abscess of the liver belongs to this latter category. I might add also aneurism of the thoracic aorta, so alarmingly frequent in foreigners in this part of the eastern hemisphere, and so very rare among natives; and a third disease, which, so far as I can learn, has hitherto received little specific notice from medical writers, but which from its extreme fatality deserves the careful study and attention of everyone practising in these parts.

The disease I allude to is known in India and well known in Java, and in the latter country goes by the name of "sprue." Under this name I propose to offer a few remarks on the subject, more in the hope of eliciting further information from others than with any pretence of myself supplying an exhaustive description. The term "sprue" is sometimes applied to the ordinary thrush of infants, associated with the development of oidium albicans in the mouth; the disease I allude to has little in common with this affection. The one is a disease of infant life, the other is entirely confined to adults.

Several Indian writers whose works I have consulted appear not to have separated the disease from ordinary chronic diarrhœa. The best account I have met with is contained in the article "Diarrhœa," by Dr. Edward Goodeve, in the first volume of Reynolds's *System of Medicine*. There it is described under the name of "chronic diarrhœa, white flux, cachectic diarrhœa;" but even this writer does not appear to apprehend thoroughly that the disease he describes is one sui generis and distinctly separable from ordinary chronic diarrhœa.

Sprue may be defined as an extremely chronic and insidious disease peculiar to warm climates, the principal symptoms of which are referable, 1st, to a remitting inflammation of the mucous membrane of the mouth and alimentary canal generally; 2nd, to diarrhœa and irregular action of the bowels; and 3rd, to anæmia and general atrophy.

The symptoms referable to the inflammation of the mucous membrane of the mouth vary from time to time, but if we see the patient during one of the exacerbations, the tongue is found to be more or less swollen, its papillæ elevated and red, shallow ulcers have formed on various parts of the cheeks, tongue and lips, and saliva, rapidly accumulating under the tongue, pours out of the mouth while it is being examined. There is no fur on the tongue, it looks abnormally clean. But for the absence of fetor, one might suppose, from the salivation, the patient was under the influence of mercury.

The gums may be swollen, tender, and prone to bleed. When this condition is well developed, the sufferer speaks with pain and difficulty, saliva dribbles from his mouth, and

eating or drinking anything but the blandest of substances is an impossibility. The mildest wine burns like brandy. Salt, sugar, and spices, or sauces of any description, cannot be tolerated. The inflammation extending down the œsophagus makes swallowing painful, or, at least, the act is attended by a feeling of heat and rawness in the throat and under the sternum.

This, the acute stage, may continue for from two or three days to a week. It subsides, to recur with considerable regularity and more or less severity once or twice a month, or perhaps oftener. I have known cases in which the interval between the attacks was but a few days.

If during this interval the mouth is examined, nothing much amiss can be found with the buccal or labial or pharyngeal surfaces. The tongue, however, is seen to be very small and usually rather pointed when protruded. The surface appears as if entirely denuded of epithelium, with the membrana propria exposed and the papillæ shrunk. It is abnormally clean, and has a characteristic dry, glazed, shining look, as if it had been brushed over with a coating of fine varnish and allowed to dry. Under the tongue the mucous folds are prominent and bathed in a watery saliva. The edges of the organ are moister and more velvety than the centre and tip, and sometimes are traversed transversely by very shallow non-ulcerated fissures. The tongue keeps in this condition till the next exacerbation, and, though not so sensitive as when this occurs, is readily irritated and pained by spices or strong wine. Though common sensibility is very much exaggerated, it often happens that the sense of taste, and sometimes also the sense of smell, is altogether in abeyance.

Like the inflammation of the mouth, the diarrhœa is periodic. In some cases the stools become quite consistent for a time, but recurrence of diarrhœa before, during, or after the attacks of inflammation of the mouth is quite certain. At times the diarrhœa assumes a semi-choleraic character, the stools being profuse, watery, and very pale, and the enormous discharge of fluid may give rise to considerable collapse. Occasionally there is vomiting at the same time. Before these choleraic attacks, which usually come on during the night, there is a feeling of intense languor, the abdomen is full and distended, and the patient is troubled with violent borborygmi. Apart from the feeling of exhaustion, the patient is relieved by the diarrhœa, and the mouth and bowels gradually revert to their former condition. As a rule, the diarrhœa is not nearly so violent as I have just described, the stools being less frequent and not so copious. If the stools are inspected, they are seen to be pale, clayey, and frothy, as if fermenting, and often even during the interval between the acute attacks they retain this appearance, whether they are liquid, pulpy, or solid.

In some cases, the constant presence in the mouth of a large quantity of watery, insipid saliva gives rise to much distress, from the necessity it entails for continual swallowing or expectoration. The patient complains of a sensation as if produced by constant and excessive drinking of cold water. Another feeling is also often much complained of. The belly feels painfully empty, the sensation being as if the diaphragm and abdominal walls were sinking in. In such cases the bodily languor and feebleness are extreme.

A notable feature in the history of sprue is the great wasting accompanying it, altogether out of proportion to the amount of diarrhœa. The victims have all a withered, shrunken and old appearance. Percussion over the liver shows that this organ partakes in the general atrophy; but in none of my cases have I been able to detect any sign of grave organic disease in this

viscus. The general atrophy of the tissues in some instances seemed to me to be more marked in the muscles than in the subcutaneous fat.

From the fact that the attacks of diarrhœa, and sometimes of vomiting and mouth inflammation, correspond in time or immediately follow each other, I opine that the mucous membrane of the stomach and bowels is in much the same condition as what we can see it to be in the mouth. This opinion is supported by the occasional occurrence of a similar inflammation around and just inside the anus, as if the morbid action had spread down through the entire alimentary canal; and from the fact that the exacerbations of diarrhœa sometimes precede, sometimes follow, the exacerbations of the mouth affection, I conclude that the starting point of the inflammation may sometimes be in the bowels, sometimes in the stomach, and sometimes in the mouth.

When the disease is of some standing, the patient is feeble, irritable, incapable of much mental effort, and anæmic. Sometimes the anæmia is profound. Not only do the conjunctivæ and lips appear pale, but the tip of the tongue when protruded may have a pale yellowish look, like a piece of cartilage.

Sprue is exceedingly insidious in its onset, and very slow in its progress. I have watched a case during several consecutive years. This chronicity is exceedingly characteristic; the patient can seldom say exactly when his disease began, nor, if interrogated from time to time during its progress, can he say positively he is better or worse. It is only when comparison is made between the condition and weight of the patient at dates widely apart that the gradual and sure progress of the disease can be appreciated.

Such is a brief description of the principal symptoms of sprue. The prognosis in a well-marked case must be grave indeed, unless the sufferer is speedily removed to a colder and more temperate climate. Left out here, after one, two or three years of suffering, there can only be one termination. According to my experience, so long as the patient remains under the conditions in which his disease was acquired, medicine and dieting, although they may do much to mitigate suffering, will not effect a cure.

As to the cause of sprue, I think we must look for it in the general unsuitability of the European constitution to tropical climates. This is vague enough, especially as we cannot formulate in exact scientific language what the physical conditions are in which this unsuitability lies. It is just possible that some accident to the alimentary canal may act as the immediate and exciting cause, and determine the advent of sprue in those constitutionally prepared by the warm climate and other predisposing influences. For, of five cases I have carefully watched since I recognised and separated this disease, two had been subjected some time before to operations on the rectum, one for fistula, the other for internal piles; a third had but shortly recovered from an attack of acute dysentery. No such influence could be traced in the other two cases: one of them was advanced in years, had an enlarged prostate and atheromatous vessels; the other, until the development of the disease, had enjoyed fairly good health. One of the cases—that following the attack of dysentery—had at one time a small amount of albumen in his urine. Age and prolonged residence in China have a marked influence as predisposing causes, for of these five cases I allude to, all of them were over 35 years of age, and all of them had been over 10 years in the East.

With regard to the influence of personal habits, I can only say that of these five cases, two had at one time lived very freely, one freely, one was moderate in the use of stimulants, and the fifth, a female, was a staunch teetotaller. Nothing seems to have so powerful an influence in aggravating the disease, and therefore, probably, in inducing it, as long-continued high temperature. From what I gather from friends who have resided in Manila and the Straits, I conclude that in these places the course of sprue is more rapid and steady than in Amoy. Probably the perpetual summer of these countries is the cause of this, and the short winter we enjoy may serve to modify, for a time at least, the onward progress of the disease. If this is the case, Shanghai and the northern ports, if they produce the disease at all, produce a milder and still more chronic form. Patients certainly improve during the cold weather.

Considering the limited nature of the field for observation afforded by the foreign community in this port, sprue must be set down as a common disease. I have never recognised it in a native. It seems to me that of late years it is more frequent than formerly, but this is possibly owing to faulty observation on my part, and my not having learned earlier to separate it from other forms of dyspepsia and diarrhœa. Now, whenever I meet a case among my own patients, or am consulted by a passer through, if I get a history of sore mouth, irregular bowels, and wasting unconnected with any decided visceral disease, I diagnose sprue.

In my attempts at cure I have tried many drugs. They have one and all disappointed me; and I have come to the conclusion that there is only one remedy for sprue, and that, to be effective, should be tried early in the disease. The patient should, as soon as possible, leave the country, and return to Europe, or seek a colder climate than China affords during the summer. This is emphatically the best, if not the only, remedy for sprue. When a patient comes with the symptoms I have described, his disease should be diagnosed as sprue, and the proper treatment—to leave the country at once—insisted on. Sprue and a temperate climate should be as thoroughly associated in the physician's mind, and in that of the public, as disease and appropriate cure, as are ague and quinine. But it is one thing to prescribe the remedy, another to get the patient to adopt it. So slow is the progress of this disease, so little urgent or alarming the symptoms, so frequent the temporary improvements, that it is seldom indeed we can move the patient to break the programme of life he has sketched for himself, or that stern necessity has entailed on him, and anticipate by a few years the furlough we all look forward to and promise ourselves. It is usually not until our prognosis has become his experience that he will consent to leave. Often then it is too late. I have twice lost patients in this way. They consented to go home only when they were worn to shadows, and their feet had become œdematous. They died on the journey before reaching Europe.

I think much good may be done by associating a disease like this with a name, for when a patient is told he has chronic diarrhœa, sore mouth, or stomatitis, he may, and generally does, until it is too late, make light of his complaint. But if in time the public learns that "sprue" is a deadly disease, and associates the disease with the absolute necessity for leaving the country, we physicians may have less difficulty in getting our recommendations carried out. It is this consideration that has in great measure influenced me to record these crude observations, and to attach to them a name. That I am not singular in giving so grave a prognosis to the unchecked disease, the following extract from a letter from Dr. ROWELL, Principal Colonial Medical Officer at

Singapore, will testify. I wrote to this gentleman on the subject; the following is an extract from his reply:—

About the chief subject of your letter, the disease you allude to is not a common one with us. It is very common, however, in Batavia, goes by the name of sprue, and is exceedingly fatal. Tedious and chronic in character, it is marked by the absence of any definite symptom.

A sore tongue, and slight diarrhœa, with altered stools, which are generally clayey and frothy. Beyond these and progessive emaciation there is little else. I have had many cases under my care; those have lived whom I was lucky enough to send away soon to England; but the majority have died, months even after having arrived at home. I think (this is my experience, however,) it is generally associated with a cirrhosed liver, or diseased liver of some kind. . . . ——— passed through here a few months ago with it, from Java, and his friends thought there was nothing the matter with him. He died all the same of it after reaching Holland. There is no cure for it except an *early* departure for England. The difficulty I have found is to get patients to believe there is anything the matter with them, and they go on from day to day, and put off their leaving till it is too late. It always begins with a sore mouth (aphthous stomatitis), and as the disease progresses, it extends down the alimentary canal, and we have a sort of subacute enteritis with follicular inflammation.

I know of no book where a description of it as one sees it here is given.

These few words of Dr. Rowell give a graphic picture of the disease, and the trouble the physician has to encounter in getting his patient to save his life.

As palliatives, I find bismuth and strychnia during the remissions, and bismuth and morphia during the exacerbations, of some service. Of course, careful regulation of diet is indispensable. The ordinary astringents are injurious. Bael fruit extract I have frequently tried, but cannot report favourably on its action. It might be otherwise could we procure the fresh fruit so strongly recommended by Sir Joseph Fayrer and other Indian writers. Wine and stimulants generally should be given much diluted. Smoking and spirits should be interdicted. Dr. Rowell writes me on the subject of treatment:—

The remedies I have found to answer best are a dose of grey, soda, and rhubarb at bedtime, two or three times a week; and through the day, chloride of ammonium and ipecacuanha wine in a vegetable tonic infusion. Taraxacum with an alkali sometimes answers; iodide of potassium I have heard is of great benefit sometimes, but I cannot speak of its efficacy from personal experience.

He, too, has found that strong astringents do harm.

I would commend the following extract from Dr. Rowell's letter to anyone anxious to experiment with the drug it refers to:—

A lady patient of mine, after being two years a sufferer, and reduced to a skeleton, gave me up and cured herself unquestionably with a teaspoonful of ol. amygdal., night and morning, expressed from the almonds as the fruit is sold in the bazaar. I had to give up practice then, having become Principal Colonial Medical Officer, so had no further chance of trying it on other patients, but I have no doubt it was the means of curing her. That is four years ago, and she is as well as possible now.

I hope these few remarks may do some good in directing the attention of others to a much neglected but very important disease.

BERIBERI, OR THE "KAKKÉ" OF JAPAN.

By DUANE B. SIMMONS, M.D.,

Eight years Director and Physician and Surgeon in Chief to Jieuzen-in (the Prefecture or Government Hospital), and Consulting Surgeon to the Police and Prison Hospitals of Yokohama, late Sanitary Adviser and Member of the (Special) Health Board of the Prefecture of Kanagawa, and President of the Foreign Health Board of Yokohama.

THE following contribution to our knowledge of a disease which is, as far as is yet known, limited in its prevalence to quarters of the globe beyond the so-called "pale of civilization," and consequently of no especial interest to any but students of geographical medicine, may at the first glance be regarded as quite uncalled for. So it might possibly have been 20 years ago. In this brief period, however, the navigation of the ocean by means of steam has so completely changed the old meaning of distance that this term no longer applies to any portions of the globe, however remote from each other. The countries of the once Far East are America's nearest western neighbours, and the island continents of the southern hemisphere are but a few days' sail from Europe. Western enterprise has thus come to plant its representatives in almost every quarter of the habitable globe; and medical men from the schools of Europe and America form a part of each and every one of these pioneer advances. Thus it is that Yokohama —a single seaport of a country but yesterday opened to the civilized world—numbers 14 western medical men among its inhabitants; and the other large cities or communities proportionally as many more.

DEFINITION OF BERIBERI.

A disease occurring during the summer months, especially in the seaport towns on the eastern and southern coasts of the Japanese islands, chronic as to form, but subject to exacerbations of varying degrees of severity, having for its characteristic symptoms anæsthesia of the skin, hyperæsthesia and paralysis of the muscles, anasarca, palpitation, cardiac and arterial murmurs (in the wet form), præcordial oppression, abdominal pulsation, and for its cause a miasmatic or specific soil exhalation.

It has two distinct forms, the wet (beriberia hydrops) and the dry (beriberia atrophia). Cases of both are met in the same locality, the former more frequently when the summers are attended by an unusual amount of rainfall and moisture, and the latter when the season is of unusual dryness. The wet form is by far most to be dreaded, as it frequently runs a rapidly fatal course in defiance of all known modes of treatment. The dry form is rarely fatal.

SKETCH MAP INDICATING THE GEOGRAPHICAL DISTRIBUTION OF BERIBERI.

Nomenclature and Synonyms.

The name "beriberi" was first applied to the disease presenting the above symptoms by the Malabar physicians, and signifies that waddling, uncertain motion observed in sheep when walking.—Johnson.

Béribéri, de *beri*, mot cingalais qui signifie faiblesse, et répété grande faiblesse, maladie particulière au Malabar et à l'île de Ceylan.—Nysten.

Hydrops asthmaticus.—Rogers.

Synclonus beriberia.—Mason Good.

Bad sickness of Ceylon.—Tanner.

Morbus innominatus.—Silva Lima.

Kakké, signifying a heavy or tired feeling in the legs.—Native physicians of Japan.

It is unfortunate that the name kakké has been used by all the foreign physicians who have published any theory on the disease as observed in this country, as it is likely to lead to confusion by implying that it is a distinct malady; whereas its identity with beriberi has never been really disputed by anyone but Dr. Hoffman, who evidently was not acquainted with the literature of the Indian beriberi.

Barbiers, though regarded by a number of writers on Indian diseases as distinct from beriberi, is beyond question only a form of it, or what I call dry beriberi.

Historical Account and Geographical Distribution of Beriberi.

In the early history of the study of this disease great obscurity existed as to its nature. It was for a long time confounded with a variety of other affections, such as paralysis of various kinds, reflex paraplegia, dropsy, anasarca, cachexia, scurvy, and anæmic rheumatism, with various diseases of the heart and pericardium (Aitken). The Anglo-Indian physicians of the Malabar coast and Ceylon were no doubt the first to suspect its specific nature, as is shown by a number of writers on the diseases of those countries. For a long time it was supposed to have a peculiar territorial range of limitation to the province lying on the Indian shore of the Bay of Bengal, between 18° and 20° north latitude, and to the island of Ceylon.

As attention became more generally directed to the subject, however, it was found to have a much wider range, embracing not only other islands of the Indian archipelago, but Java, Sumatra, Borneo, New Guinea, Banka, Celebes, the Moluccas, and the countries bordering on the Red Sea. In 1866, Dr. J. F. da Silva Lima, of Bahia, Brazil, published in the *Medical Gazette* of that place a series of observations on a disease which he called morbus innominatus, and which appears, in his essay since issued on the subject, to have been beriberi; and in 1870 I was the first to recognize its existence in this country. The comparatively late discovery of beriberi in the last two geographical localities, so widely separated and remote from its heretofore supposed limits of prevalence, is by no means proof or evidence that it had not previously existed in them. This fact is indeed established beyond question by fairly accurate descriptions found of the disease in some of the older medical books of this country, and though I am not in possession of the same facts respecting the prevalence of the disease in Brazil previous to the report of

Dr. SILVA LIMA, I think it more than probable that such was the case there. The discovery of a disease in countries where medical science had previously assumed no definite shape may mean, therefore, only its recognition and description for the first time by competent observers. Such was certainly the case in this empire; for though, as I have said, the disease had undoubtedly existed here for a long time, the fact was not known to western medical men until after the recent opening of the country. It is curious that as yet there is no certain knowledge of the existence of beriberi in China, lying as that empire does between two geographical seats of its prevalence, with its hundreds of miles of sea-coast dotted with innumerable low-lying, crowded and dirty towns—conditions especially favourable to its production both here and in India. It appears almost too much to suppose that this want of knowledge of its existence there means exemption from it.* Let us presume that no favourable opportunities have existed for its observation by Europeans; for although China has been nominally open to foreigners for a long time, I believe that the diseases affecting the mass of the people are but imperfectly understood. Even in Japan, where everything foreign or western is welcomed, especially medicine (by no means the case in China), I had resided six years in a town of its endemic prevalence before my attention was called to its existence, though often solicited by the native doctors in consultation for nearly every form of disease. On inquiring of them later as to their reason for never asking my advice for this disease, they informed me that they thought it a malady peculiar to the country, and therefore concluded that I should know nothing about it. It is an important fact that no allied disease exists on the European side of the Mediterranean, or in Northern America. Even its presence in its old Indian haunts appears to be much less than formerly, as I am informed by Dr. T. J. TURNER, late fleet surgeon, United States navy, Asiatic station, who made especial inquiries in regard to it. In fact, he was told that he could learn more of the disease in Japan than in India. This stands in strong contrast to the accounts of its ravages some years ago in that country, where, according to WARING, it was at one time the most fatal disease, next to cholera, to which Europeans were liable, while among the native convicts in the Indian gaols the mortality reached 36.5 per cent. Several epidemics, however, as late as 1863, are reported to have occurred on board French transports conveying coolies from the Coromandel coast to the colonies. During the recent Dutch expeditions against the Acheenese, the disease is also said to have appeared among the troops. Dr. SILVA LIMA states that in 1866 it raged with peculiar violence among the troops engaged in the Paraguayan war, in the direction of the back provinces of Mato Grosso.† Its absence from Europe and from the northern States of America is a somewhat remarkable fact, though no more so than the absence of yellow fever from eastern Africa and Asia.

LITERATURE OF BERIBERI.

This, at the first glance, appears to be quite meagre, which arises from the fact that some of the popular works on the practice of medicine either make no mention of the disease at all or

* Dr. ANDERSON, of Tokio, in his monograph on Kakké, states that in a clinical medical work, written in 1321, and afterwards reprinted in Japan, a remarkably clear account of the symptoms of kakké is given; and the author traces the complaint to the time of the Emperor HWANGTI (2697 B.C.).

† Since writing the above, I see by a note in the *New York Medical Record* that beriberi has re-appeared in Brazil, in so severe a form that a commission has been appointed by the government of that empire for its investigation.

give it only passing notice. The reason for this is no doubt because of its generally supposed limited geographical range, and hence the inutility of occupying valuable space with the description of a malady which neither authors nor readers have had, or in all probability will have, an opportunity of seeing. AITKEN'S *Science and Practice of Medicine*, however, being intended to meet the wants of English physicians abroad and at home, is an exception to this rule, and contains a very good description of the disease. The authors whom he quotes are evidently those whose contributions to the subject were made in the form of monographs, army medical reports, and journalistic articles. Among these writers are HAMILTON, CHRISTIE, WARING, MALCOMSON, HUNTER, EVEZARD, FARRELL, DICK and RIDLEY. COPLAND'S *Dictionary of Practical Medicine* also, and *Le Dictionnaire de Médecine et de Chirurgie*, contain very good descriptions of the disease. The article on Beriberi in JOHNSON'S *Influences of Tropical Climates* is by Mr. J. RIDLEY, and was taken from the *Dublin Hospital Reports*. A short essay by Dr. DAMMANN, and a somewhat lengthy one by Dr. L. F. PRAEGER in the *Annales de Médecine navale néerlandaise*, 1870, are before me. The literature of the disease in Brazil is, as far as I am aware, confined to the writings of J. F. DA SILVA LIMA in the *Medical Gazette* of Bahia, and an essay in Spanish, a review of which is contained in the *Edinburgh Medical Journal* for March 1873.

The literature of the Japanese disease by foreign physicians is limited to a paper read before the German Asiatic Society by Dr. HOFFMAN, one by Dr. WERNICH, in a German periodical, and one by Dr. WILLIAM ANDERSON, in *Guy's Hospital Reports*, which has since appeared in pamphlet form. A number of Japanese physicians have written on the disease, under the name of kakké. The earliest description of it was by OSADA TOKUHOU, in 1562, next by TACHIBANA NANKÉ, in 1715, and the third by KATÔ SEITO, at the end of the last century. Their speculations and conclusions, therefore, though curious, are hardly worthy of a place in a scientific journal.

I first recognised and commenced the systematic study of beriberi in 1870, since which time I have seen and treated a large number of cases, not only in the Government Hospital of which I have charge, but in a considerable private and consulting native practice in both Yokohama and Tokio, the capital. Though the first foreigner to observe this disease in this country, I have been anticipated in publishing an account of it, hoping to obtain in the meantime additional data and information upon which to base my opinions and conclusions.*

* A kakké or beriberi hospital was established in Tokio by the government in 1878, having for its object: (*a*) the scientific investigation of the disease; (*b*) a comparative trial of the value of the foreign and Chinese systems of medicine in its treatment. The institution is divided into equal parts for this purpose, and leading men representing the two systems having been placed in charge of them, the peculiar experiment is watched with no small degree of interest by the advocates of the two schools. I understand that the Educational Department, which officially recognises only the foreign system of medicine, yielded a reluctant compliance to this competitive plan, which was favoured by the Emperor, who still retains a certain amount of faith in the medical doctrines of his ancestors. Evidently that the trial might be a fair one as between Japanese, His Majesty requested that no foreigner should be employed or take any part in it. The result, so far as appears in two reports of the institution which have been issued, is much to the discomfiture of the disciples of the Chinese system. The representatives of the foreign school engaged in the work are men who have received their medical education in Europe, and some good results may be looked for from their studies. As yet they have confined themselves mostly to statistical work. Some half-dozen postmortems have been made by them, the results of which have not yet appeared.

Etiology.

Wagner says that etiology, or the knowledge of the causes of disease, is one of the weakest chapters in pathology. It is eminently so in regard to beriberi, as few of those writing on the subject more than hint at certain probable causes. My own investigations have led me to the almost definite conclusion that its exciting cause is a specific miasm or soil exhalation which, like paludal malaria, shows itself in more or less well-defined areas. An important rôle is played by a number of circumstances or conditions rendering particular individuals especially susceptible to the influence of the poison. In general terms, beriberi is a disease of the low-lying towns on the seaboard, though occasionally met with in the interior. Its period of endemic prevalence is the summer months, and it often becomes severer or epidemic in seasons of unusual rainfall. During the winter months no new cases occur, and the old ones mostly recover. Actual or old residents of the locality of its prevalence are much less liable to contract the disease than strangers (natives), and even in them a certain period for its development is required; hence the proportionally large number of soldiers, sailors, policemen and students—drawn mainly from the rural districts—who suffer from the disease. Debility and anæmia are not predisposing causes of the kakké of Japan; on the contrary, the best fed, best nourished, and best cared for are usually its most frequent subjects, while the weak and destitute, with all the attendant conditions of bad hygiene, are only exceptionally attacked by it. The old and young are almost entirely exempt from the malady, and women rarely suffer from it except during the puerperal state. One attack predisposes to others in succeeding years, if its subjects remain in the locality where the disease prevails, while removal, if the disease is not too far advanced, surely produces an amelioration of all the symptoms, and in most cases effects a cure, even without medical treatment.

Aitken says, "The etiology of beriberi is but little known; . . . . . Malaria, alternations of climate and temperature, noxious material in the waters of districts, have all been indicated as operative agents in bringing about the disease. But looking to the fact that all the phenomena of the disease point to anæmia, it may be generally stated that whatever tends to induce this state will favour the development of beriberi." Dr. Dammann says of beriberi, "Autant d'auteurs, autant d'opinions diverses." It has been attributed to the continual rains which occur in India from the first days of November till the month of May, and the alternations of cold and heat to which the inhabitants of the country are exposed. According to others, beriberi is the consequence of insufficient or bad nourishment, which produces a dyscrasia of the blood, and though not identical with the dyscrasia of scurvy, has a strong resemblance to it. It has been ascribed to a progressive paralysis of the spinal cord, produced by malaria, or to the development of a rheumatismal paralysis. Bernhardt refers the cause of beriberi to atmospheric influences, and ranges the disease among rheumatismal affections. Rochard believes the cause to be found in the diet, especially rice. Copland, in his *Dictionary of Practical Medicine*, says, "Opinions respecting both the remote and proximate causes of the disease differ very materially among those who have had opportunities of observing it." He quotes the following, however, as the most trustworthy authorities on the subject, viz., Drs. Christie and Rogers, who regard beriberi as a consequence of deficient and poor diet, impure and moist air, or

prolonged exposure to marsh exhalations, and consequently a disease of debility—an opinion which is in general accordance with that of Messrs. DICK and RIDLEY.

LE ROY DE MÉRICOURT says that among the numerous and often contradictory opinions advanced on the subject of the etiology of beriberi, "it is impossible to ignore the capital rôle which alimentation plays in the production of this disease." According to PRAEGER, the disease is only a variety of scurvy, as already stated by HELLEMANN in his academic thesis in 1857. On this subject PLOMB expresses himself of the same opinion. PRAEGER also says miasm has no influence in the production of beriberi if alimentation is sufficient; he further observes that "Of all the explanations given of the nature of this disease, that which appears to be the more correct is that it is a rheumatismal paralysis, to which may always be added œdema." Dr. J. F. DA SILVA LIMA says, "Different observers in Brazil have suggested very various explanations for the outbreak of the disease in that country, all, however, attributing it to more or less local causes applicable to but a very limited number of cases, and therefore of a very secondary, if any importance at all. Of any more general cause applicable to the disease in all its various manifestations, we are, and it is perhaps as well to confess it at once, entirely ignorant." HOFFMAN speaks of some general causes of the disease which appear as predisposing, but does not commit himself to any specific one. ANDERSON, though not giving any definite cause in his first writings on the subject, concludes, in a more recently published monograph, that an atmospheric poison of local origin is the materies morbi.

The native Japanese physicians believe that the cause of the disease is an emanation from the ground, thus explaining the first appearance of the malady in the legs.

Though the authorities just quoted comprise some of the most reliable as well as latest writers on beriberi, or kakké, it is easy to see that none have added much, if anything, definite to our knowledge of the direct or immediate cause of the disease. This question, therefore, equalling, if not exceeding, in importance any other in connexion with this affection, is to all intents and purposes still an open one. Before criticising the views of others on this subject, I will present my own. Though these may appear drawn out almost beyond the limits appropriate to a paper of this kind, I do not hesitate to give them in full, as the subject demands much more than a passing notice.

PREDISPOSING CAUSES.

1. *Age.*—A large majority of all cases of beriberi occur between the ages of 20 and 30. Confirmatory of this opinion, I find, in the report of the Beriberi Hospital in Tokio, the following: "In 85 cases received in that institution in a given period, 1 was under 15 years, 14 between 15 and 20 years, 50 between 20 and 30 years, 11 between 30 and 40 years, and 9 between 40 and 60 years."

2. *Sex.*—This is remarkable from the fact that comparatively few females suffer from beriberi, except during pregnancy and a short time after confinement. It shows itself soon after the middle of gestation, in the wet form of the disease, and culminates at its completion. In the dry form extreme muscular atrophy and paralysis often come on later. Dr. STUART

ELDRIDGE informs me that in Hakodadi, while he had charge of the Government Hospital there, kakké was very prevalent and fatal among pregnant women.

3. *Occupation and Social Condition.*—Those of sedentary employments are most subject to the disease. Coolies and common labourers, jinriksha men (drawers of small chairs or carriages), of whom there are great numbers in the country, bettoes (footboys, or men who run along with the horses as attendants), and farmers rarely suffer from it. Sailors of all classes, especially those on board men-of-war and small coasting junks, show a marked susceptibility to the malady. This is especially observed in the latter when, coming from a distance, they are obliged, while the vessel is receiving or discharging cargo, to remain some time in a port where the disease is prevailing. I have seen not unfrequently a whole crew of half-a-dozen or more men, showing no signs of beriberi on arrival at Yokohama, suffer more or less severely from it a short time afterwards. In these cases the disease was contracted after arriving in port, and after a free supply of fresh provisions had been obtained. The theory that beriberi is a form of scurvy would seem to be weakened, if not wholly disproved, by this fact. Dr. ANDERSON gives a striking example of the susceptibility of sailors to beriberi in the case of a Japanese man-of-war lying at Yokosuka, the naval dockyard. Out of 300 seamen, about 70 were attacked with it, of which number 20 died in a very short time, and 47 were sent to the Naval Hospital in Tokio for treatment. On inquiry, the food, clothing and exercise of the sailors were found satisfactory, but nearly the whole crew slept during the night in a space allowing but 32 cubic feet per man, while, owing to the sheltered anchorage of the ship, the air was almost stagnant. After a medical investigation, the sleeping apartments were at once altered by the Admiralty, and, as a result, the epidemic almost entirely ceased. This Dr. ANDERSON puts forward as an argument in favour of bad air, etc., being not only predisposing but also exciting causes of the disease, while I hold that they are the former only.

Two points are here to be noticed, the bearing of which will be seen further on: 1st, Yokosuka is a port of especial prevalence of the disease, having two or three times suffered from it in epidemic form; 2nd, the sailors were not residents of the place, and were therefore unacclimatised; further, from the harbour being a small one, they were exposed to the exciting causes of the disease, even if they remained constantly on board, which is not to be supposed—in which case the dampness and foul air of their quarters may still have been only predisposing causes. The same may be said of the junk sailors already referred to.

An equal, if not greater, susceptibility to the disease is shown by soldiers, policemen, students, merchants, and clerks from the country.* Other things being alike, those occupying the better social positions in life, the well-to-do generally, show a greater susceptibility to the disease poison than those of the opposite scale. It is remarkable also that not only those who are well provided for, but those also having the general appearance of health and vigour, as shown by firm and well-developed muscular systems, are among those in this country who usually suffer from it. So marked is this in my experience that I am disposed to place it here among the predisposing causes of the disease, notwithstanding the strongly expressed opinions

* In 98 cases received in the Tokio Beriberi Hospital, there were 39 students, 18 soldiers, 14 merchants, and 27 of other occupations.

already quoted to the contrary. Those, on the other hand, of naturally weak constitutions, or who are suffering from chronic diseases, rarely become its victims in any form. As a sequence or complication, however, of acute diseases, such as miasmatic and continued fevers, and also of syphilis, it is not uncommon. Though beriberi in India is peculiarly severe in gaols, it is quite rare in such institutions in this country, unless they are within the limits of its prevalence; even if so, their inmates are not especially liable to the disease. Here, however, the prisons are mere stout wooden cages, and, if possible, too well ventilated for comfort, while in India they are of stone, poorly ventilated, and said to be damp—moisture being, in my opinion, a powerful predisposing cause.

4. *Diet.*—Though this is so strongly urged by most Indian writers on beriberi as a predisposing cause of great potency, or even an exciting one—especially if the food is bad or insufficient,—in this country, according to my experience, it is of doubtful importance. Indeed, as I have said, those who are in a condition able to afford good and abundant food are most liable to beriberi. I must admit, however, that rice of the better quality is badly borne by those suffering from this disease, while at the same time it is the chief food of those most liable to it. A change, too, from this to a coarser food, such as barley and beans, is a measure of great importance in the treatment of the disease. In what the difference consists, unless the latter articles are more laxative than rice, or contain more potash (rice being poor in this respect), I am unable to state.

5. *Relapse of the Disease.*—A primary attack of beriberi renders its subject for years afterwards most markedly susceptible to it, and for several successive summers he is pretty certain to suffer with it in a greater or less degree, so long as he remains in the same or similarly infected locality, though all symptoms usually disappear during the intervening winters.

6. *Non-acclimatisation.*—Though the power to resist certain diseases, acquired by an early or prolonged residence in the locality of their especial prevalence, is but little understood, yet certain facts bearing on this point have been so clearly established in the course of my investigations of beriberi, that I am led to consider it a factor of great importance. The converse, or the diminished resistance shown by strangers (Japanese) is still more striking, because more easily demonstrated in the proportionally large number of transient residents (native) of the affected localities, such as Yokohama, who suffer with the disease. This explains several important facts already mentioned, viz., 1st, the especial prevalence of beriberi among soldiers, policemen and students, who are drawn from the rural districts, and stationed in the large seaport towns where the disease is endemic; 2nd, its greatly increased and often epidemic appearance in these towns after the congregation in them of the above-mentioned classes, following certain political changes.

7. *Race.*—It is not without some hesitation that I indicate this as a possible predisposing cause. The following are the facts bearing on this point. Foreigners, or natives of Europe and America, in Japan enjoy nearly absolute exemption from beriberi. Out of a population of about 2,000 foreigners in Yokohama, a district of especial prevalence of the disease, not a single well-authenticated case has been met with. On the other hand, WARING says of the disease, "Next to cholera, beriberi must be regarded as the most fatal disease . . . to which

Europeans in India are liable." PRAEGER mentions, however, that European residents in (Dutch) India are only exceptionally attacked by beriberi.

8. *Season and Temperature Changes.*—Not only do very few primary cases occur before March and April, or after October, but the vast majority of those attacked, except when the acute disease is followed by extreme muscular degeneration and atrophy of the extremities, recover more or less completely during the intermediate or winter months.* The influence of an elevated thermometric range is therefore evident. Still more unfavourable conditions are cold and wet summers in which changes are sudden. It is then especially that the wet form of the disease shows itself either sporadically or epidemically among the transient residents of all the localities furnishing the elements of its production. With a sudden fall of temperature after a few hot days, accompanied by rain, I have often been able, when having a number of beriberi cases under treatment, to predict an exaggeration of all their symptoms, and foretell an increase in the number of cases in the outdoor service. I have thus come to regard beriberi as an exceedingly treacherous disease, having seen many cases up and about with comparative comfort on one day suffer the most terrible agonies of oppression and suffocation the next, to be relieved only by death, without any other apparent cause than a sudden fall of a few degrees of the thermometer, with a drizzly wet night. Local sources of dampness, such as the forecastles of ships, the hold, and passenger accommodation of transports, are strong predisposing causes. The history of marsh miasm, it is well known, furnishes similar examples. This no doubt accounts for the outbreaks of beriberi on board the French ships in 1852, when 20,000 Indian emigrants were taken to the Coromandel coast (ROCHARD). I have observed that the inmates of stone buildings, even in good localities, are especially subject to beriberi, a circumstance which explains its being called a gaol disease in India. Another explanation for the outbreak of the disease on shipboard at sea may be found in the water used for drinking, which, being procured from the shore, may be the vehicle of the poison.

EXCITING CAUSES.

All my investigations of the exciting causes of beriberi go to justify the conclusion that it is a specific miasm or ground exhalation. I was led to study this source of the materies morbi by the striking resemblance which exists between the circumstances and conditions which appear to give rise to it and to marsh malarial affections generally. This will be readily seen by the following comparative table:—

MARSH MALARIAL DISEASE.	BERIBERI.
1. Endemic or epidemic.	1. Endemic or epidemic.
2. Limited to well-defined localities, and never spreading beyond them, except from more or less easily recognised causes.	2. Limited to well-defined localities, and not often observed to spread beyond them, except from well-understood causes.

*The dates of attack, or, more properly, of coming under treatment, definitely ascertained of 265 cases were as follows:—January, 1; February, 1; March, 2; April, 5; May, 13; June, 39; July, 63; August, 80; September, 37; October, 24.

3. The specific poison of the disease may remain latent for some time, and then suddenly appear when the subject is some distance from its source; usually the result of sudden changes of temperature.	3. The same.
4. The manifestations may be chronic, subacute, or pernicious.	4. The same.
5. Decidedly a disease of warm seasons, and usually disappearing with the approach of cold weather.	5. The same.
6. One attack no protection against another, but a strong predisposing cause to it.	6. The same.
7. Women less liable during pregnancy.	7. Women more liable.
8. A period of incubation often observed.	8. The same.
9. If exposure to the cause is prolonged, it is usually accompanied by organic lesions more or less decided.	9. The same.
10. Age and occupation *not* predisposing causes.	10. Age and occupation strong predisposing causes.
11. Non-acclimatisation exerts a powerful influence over individual susceptibility to the disease.	11. The same.
12. No geographical limitation, but more prevalent in hot and temperate climates.	12. A somewhat peculiar geographical limitation, as far as known.
13. Sudden meteorological changes have a very decided influence on the production and progress of the disease.	13. The same.
14. Removal of the patient beyond the limit where the disease prevails exercises a powerful curative effect, even when other modes of treatment have failed.*	14. The same.

In my investigations of this branch of the subject, I have carefully selected this particular area of prevalence (Yokohama), and venture to assume that one locality though small in extent, if studied carefully, will be of greater value in determining the correctness of the theories advanced than a mass of evidence compiled from the observations of others, or scattered over distant and wider fields; the lines will be sharp and well defined, and a few facts can then be determined having a direct bearing upon the points to be established. A long residence here enables me to give a description of the place before the town was built, as well as the topography at present—both having an important bearing on the exciting causes of beriberi. On my arrival

* I will here state, however, that, notwithstanding the above showing, I hold decided opinions as to the distinct nature of the two poisons, though believed by some authors, as already stated, to be identical.

here 19 years ago, four months after the opening of the country, I found a small fishing village stretching along the shore of a deep bay at the mouth of one of the numerous valleys, with high bluffs on either side, such as everywhere break the coast line of this sea-girt empire. Behind the somewhat elevated gravel belt occupied by the town, and stretching inland for three or four miles, were low rice fields on either side of a sluggish stream. As the town grew, these fields were filled in by soil from the bluffs, until, to-day, a city of over 50,000 inhabitants rests on this new-made land—in some parts below the sea level. This, in general terms, is the description of those localities where the disease is most prevalent. As may be easily seen, drainage is difficult, and the soil is saturated to within a few inches of the surface with brackish water. One of the results of this exposure of new earth, much of which was not immediately covered with houses, was the appearance of marsh malarial diseases, in severity and frequency before unknown. In a like manner, cases of beriberi began to appear. Their number remained proportionally small, however, for some years, but the disease took an epidemic form at the time when there was a large influx of soldiers, policemen and students. I am aware that those who hold the theory of bad drainage and crowding, as in schools and barracks, as the cause of beriberi, have here many of the required conditions in support of it. I am willing to admit these as possible predisposing causes, but take positive issue with the statement that they are the exciting causes of the malady.

As to its local characters in Yokohama, I have had abundant opportunities for observation. Thus, cases are frequently met with on the side of the surrounding bluff overlooking the town, which has unexceptionable drainage, and buildings well ventilated—as, for instance, this hospital and the Normal School; yet beyond, and on the other side of the same bluff, there are none. This is accounted for by the lifting of the miasm from the lower town, and its carriage to the bluff and buildings thereon by the south-westerly winds, which are the prevailing ones in the summer. The following fact goes still farther in proving the strictly local character of the exciting cause of beriberi. Yokohama being the capital of this province, criminals are all brought here for trial. During their examination, some are kept in a gaol in the town, after which they are transferred to the prison proper to serve the terms of their sentences. The prison is situated just beyond the limits of the town and on the *other side of the bluffs* surrounding it. Here also the situation is low and the drainage bad, while 500 or 600 convicts occupy cells containing 70 or 100 each. Occasional cases of primary beriberi occur in the gaol in town, but none ever occur in the prison on the *other side* of the bluffs. The sanitary condition of this prison compares very badly with that of the Normal School, which contains from 60 to 70 students, all occupying good-sized dormitories; yet 50 per cent. of all the students in this school suffered more or less from the disease during the summer of 1878, and likewise not a few in the Ken Hospital—close by the school,—who entered with other diseases. Acclimatisation cannot be urged in the case of the prisoners as the cause of their exemption, as at least 50 per cent. of them are from the country, as are the students. The fact is that the prison is located *beyond* the limit of the prevalence of the specific poison, and the school and hospital are within it, while the respective localities of prevalence and non-prevalence are separated from each other by a few hundred yards only of high land. The disease, as I have said, exists mainly in the seaport towns on the eastern and southern

coasts of the islands comprising the empire, more particularly those situated on new-made land. Exceptions exist, however, to this: the city of Kioto, well situated, with a fine water supply, a number of leagues from the sea, suffers somewhat from the disease. The same may be said of some other places in the interior, and of a few seaport towns on the north and north-west coasts.

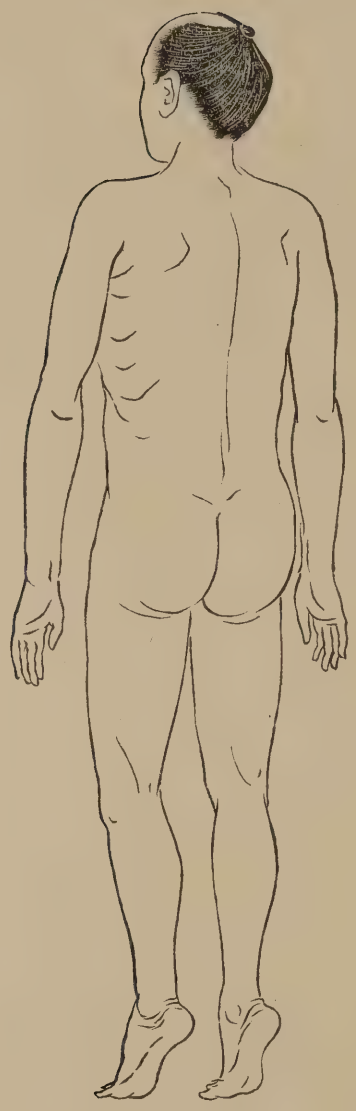
With regard to malarial miasm, it is generally admitted that heat, moisture, and vegetable decomposition are indispensable factors, and yet, who would assert that malarial disease does not occur in elevated localities possessing a dry, barren soil, or during the winter months? These apparent exceptions are with difficulty reconciled with the usual views entertained as to the origin of the disease, but nevertheless do not shake the faith of medical men in the theory. I have long entertained the idea, however, that heat, moisture, and vegetable decomposition, as causes of malarial miasm, are only predisposing; the miasm itself being some unknown factor for the development of which these predisposing causes act, as similar conditions bring forth in due course the various phenomena of vegetable life. It is this view that I take of the origin of the specific poison which gives rise to beriberi. The almost simultaneous appearance of malarial disease and beriberi, consequent on the same conditions in this place, together with the striking similarity between them, would suggest a common cause, but a close scrutiny of the course of the disease, and the utter uselessness of quinine forbids this conclusion. Another argument in favour of its local origin is its great prevalence among those who come from beyond its limits to reside within them. This has been established by what was said under the head of non-acclimatisation, and still more conclusive evidence is afforded by the rapidity and almost certainty with which sufferers find relief, or recover entirely, on being removed beyond the area of its production; and the equal rapidity and certainty with which all the symptoms of the malady re-appear if a patient returns too soon, or at all, to the same or similarly infected localities. The following case well illustrates this:—

The hospital apothecary presented himself on 10th August 1878, with the usual symptoms of kakké in considerable severity, having suffered from its slighter manifestations for some days. He was advised to go at once to the mountains, about 30 miles distant. Being familiar with the disease, he was able to give a clear account of himself. On his way he stopped at the house of a friend, about four miles from the hospital, and in three or four days began to feel better; the sense of suffocation and palpitation, from which he suffered on leaving, gradually lessened, and he was no longer inconvenienced. On the 25th of August, 15 days afterwards, he reported himself fit for duty, presenting no symptoms of the disease to an ordinary observer. Scarcely 48 hours had elapsed, however, before some of the old symptoms began to be experienced, and they increased until he was severely ill again. On 3rd September, eight days after his return, he was again sent to the country—with some difficulty, however, due to decided paralysis of the lower extremities, which symptom was less marked on the first occasion. By degrees the symptoms all subsided, and upon 1st October, 27 days after leaving the hospital, he, for the second time, reported himself fit for duty. He was somewhat weaker than on his first return, and although no decided exacerbation or relapse again occurred, he did not make any further progress toward recovery until later in the season, when those suffering from the disease generally recover. No medicine except an occasional cathartic was given.

I have recorded a number of cases presenting the same general features of rapid recovery and quick relapse respectively, following a removal to the country and a return to

the infected locality. Not only do all medical men, both native and foreign, now urge their kakké patients to go to the mountains as soon as the symptoms appear, but the army and navy departments send large numbers nearly every season to the mountains from their respective hospitals, as the best and surest means of treatment. In 1877, so many students in one department (Marine paymasters) in Tokio were ill with the disease, that it was transferred *en masse* to a temple four or five miles from the city, where the session was continued; those sick recovered, and no more cases developed. Following my instructions, the Police Department of Yokohama has selected a temple a short distance beyond the limits of the town as a sanitarium, to which the members of the force are transferred from the General Hospital when the number and severity of the cases warrant it. In 1878, the beneficial effects of this plan were shown in a striking manner; suddenly, as is not rare, a number of subacute cases—those most common—took on a pernicious form, and a large number of new cases appeared both at the Police Hospital and in my own. Within 36 hours, three men in the former and one in the latter had died. Twenty cases were immediately transferred to the Temple Hospital without the city limits, belonging to the Police Department, with the most satisfactory results, no more deaths occurring from the uncomplicated disease. It is worthy of note that the Police Hospital (in the city) is beautifully situated, halfway up the bluff, but on the town side, on a plateau overlooking the town. The space it occupies is ample and well drained, while the wards are well ventilated and not overcrowded, equalling in every respect the Temple Hospital retreat, except that the latter is out of town, in a locality notoriously free from beriberi miasm.

However produced, beriberi is distinctly a specific disease. According to the testimony of Indian observers, the condition is one of anæmia. That they should have been imbued with this idea is not to be wondered at when we consider the fact that the races of those regions show a greater disposition to blood poverty and cachexia than those of the temperate zones. But inasmuch as the causes of anæmia when affecting a large number of persons, are generally the same, viz., bad and insufficient food, impure air, and malarial exhalations, why do we not see, in some degree, the characteristic symptoms of beriberi wherever these conditions exist? When we find the disease showing itself in a race like the Japanese, among whom absolute or relative poverty of the blood, though more common than among beef-eating people, is by no means the rule, the question whether the disease is not rather the cause of the anæmia—when present,—is naturally suggested. We have two prominent facts: 1st, that in this country the well housed and well fed generally suffer most; 2nd, that in the incipient stage, paleness of the mucous membranes, and other symptoms of anæmia are greatly the exception. It was with preconceived notions of the anæmic nature of the disease that all the foreign medical men who were first called upon to treat kakké wasted precious time in giving their first cases preparations of iron, and the routine treatment for anæmia, with the result of losing most of them; while the Japanese doctors (rude empiricists) saved most of their cases by the opposite plan of rapid depletion and evacuation of the enormous collections of serous fluid, by the use of hydragogue cathartics. Even in those cases where the native mode of treatment appeared less urgently indicated, iron, quinine and tonics proved of little value.



Position sometimes assumed in walking after partial recovery from Beriberia Atrophia—due to shortening of Calf Muscles.

Clinical History of Beriberi.

There are two forms of the disease, viz.:—

1st. Beriberia hydrops (wet beriberi), in which there is a hydræmic condition of the blood, and distension of the areolar tissue generally with serum, giving the body a bloated appearance.

2nd. Beriberia atrophia (dry, or atrophic beriberi), in which there is a notable deficiency of fluid in the vessels and in the areolar tissue, and early atrophy of the muscles.

These two forms of beriberi were regarded by the early Indian writers as distinct forms of the disease, the latter receiving the name of barbiers.

In general terms, beriberi may be divided into four stages—prodromic, subacute, acute or pernicious, and chronic. From the very insidious nature of its approach, sometimes extending over a period of several weeks, it is often difficult or impossible to determine the exact time of invasion. It is generally admitted that a residence of some weeks in an infected locality is necessary before any decided symptoms make their appearance. Being a disease essentially of warm seasons, the length of this incubation depends on the particular months during which exposure occurs. As in many other diseases of slow development, the symptoms of the prodromic stage are certain not easily defined feelings of indisposition, as an occasional sense of chilliness, inaptitude for mental exertion, and especially a tired feeling in the lower extremities. A peculiar feature of this stage is that it is not always steadily progressive, but intermittent, with periods of from three to five days in which the patient may feel comparatively well. In exceptional cases only, in this climate, does the acute or pernicious form immediately succeed the prodromic stage. A period of uncertain length intervenes, during which the characteristic symptoms appear and constitute the subacute stage. The first symptom is generally anæsthesia of the skin over the anterior tibial muscles, in the tips of the fingers, and around the mouth, in the order given. Paralysis in varying degrees next declares itself in certain groups of muscles, usually those immediately underlying the regions of anæsthesia. As a consequence, there is dropping of the toes, causing the patient while walking to lift the feet high so as to clear the ground, giving rise to the peculiar gait noted by many observers as characteristic of the disease. A sense of constriction in the muscles of the calves is usually experienced at the same time, arising from a veritable contraction which causes their enlargement and hardness, with tension of the tendo Achillis, increasing the difficulty of lifting the toes. A feeling of tightness in the chest usually accompanies this condition, due, no doubt, to some degree of paralysis of the muscles of respiration. If firm pressure now be made upon the muscles, more or less tenderness will be found to exist, especially noticeable in those groups occupying the posterior part of the leg, the inner sides of the thighs, back of the forearm, and the upper part of the chest; or it may be general, but less in degree. More or less heart palpitation is complained of by the patient on making any considerable exertion. Up to this point the symptoms are common to both forms of the disease; to them the characteristic feature of beriberia hydrops is now added, viz., anasarca. Its first manifestations are in an œdematous condition of the areolar tissue of the anterior part of the leg. That this is more or less general, even at an early stage of the affection, is evident from the plump appearance of the subject, and a certain sallow-white colour of the skin, especially

that of the face. In uncomplicated cases the temperature is normal, or a little below the normal point; there is likewise no increase in the frequency of the pulse. The quality of the pulse, however, is changed, and characteristic in both forms of the disease. Thus, in the wet form it is full, large, and easily compressible, showing a great diminution of arterial tone; while in the dry form there is an exactly opposite condition. If the heart be now examined, a decided systolic murmur will be heard most distinct over the pulmonary valves, the same being in most cases of wet beriberi found to exist in all the large arterial trunks. The heart gives evidence of varying degrees of dilatation and want of tone, such as increased area of dulness on percussion, intercostal pulsation, etc. In the dry form murmurs are either slight or wanting altogether, and the area of cardiac dulness is variable. These differences are not simply expressions of degrees of severity of the disease, as will be shown farther on. In both forms the appetite is little impaired in the earlier stages, but if the stomach be over-distended, there is an increase of præcordial oppression. There is sluggishness of the bowels in the wet form, and the urine is scanty; in the opposite form, there is but little deviation from the normal. In this country the vast majority of cases of either form of beriberi are *subacute*. The yearly appearance of the disease in the same individual, and its long duration, constitute the *chronic* form. From this it will be evident that the acute or pernicious stage or form of the disease is only an exaggeration of the subacute, as is observed in other affections, notably those of marsh malarial origin.

The term pernicious is, strictly speaking, applicable to the wet form of the disease only, the dry form being rarely fatal. A marked case of the wet form is always to be regarded as more or less dangerous, from the suddenness with which acute symptoms often declare themselves. In these the anasarca, which, as has been stated, constitutes the leading clinical difference between the two forms of the malady, plays an important rôle. It often happens that in the course of a few hours the local œdema in the extremities and the slight puffiness of the face become extreme, and the areolar tissue of the whole body is gorged with fluid. The cavities, especially the pleural and pericardial, suffer more or less distension with serum, thus mechanically embarrassing the action of the organs they contain. The action of the heart becomes laboured, the lungs œdematous and filled with coarse râles. A terrible sense of suffocation comes over the patient, causing him to seek relief by constant changes of position. The stomach becomes irritable, and vomiting of greenish-yellow fluid occurs, this being almost always prognostic of a speedily fatal termination. The acute stage in the dry form is characterised, on the contrary, by a rapid diminution of the fluids of the body, and an increase in the existing paralysis and muscular atrophy.

Case 1. *Pernicious Beriberia; Death; Autopsy.*—S., æt. 26; policeman. Parents not living; father died from some chronic disease, mother from dropsy. Has three brothers and one sister living. Has never had syphilis or rheumatism, and his general health up to the present time has always been good. Entered the hospital 15th June, with the following history:—

During the first days of May, began to feel unwell, had occasional slight chills, followed by heat flashes, a general sense of malaise, and a tired feeling in the legs. By degrees there appeared, much in the following order, symmetrical anæsthesia of the skin over the tibio-fibular space in both legs, gradually extending up the anterior surface of the thighs to the lower part of the abdomen, then to the tips of the fingers, the dorsal surfaces of the forearms, and around the mouth; œdema of the anterior portion of the legs between the knee and ankle; a sense of fulness, attended by occasional spasms or constrictions of the

muscles of the calves, slight pain in the knees, and weakness, which, with dropping of the feet and toes, caused him to stumble. Any considerable exertion brought on painful palpitation and præcordial oppression. Bowels sluggish; urine scanty.

Present Condition.—He was above the medium Japanese stature, stout, but not corpulent, muscles firm and well developed. There was slight puffiness of the face, with characteristic sallow colour of the skin. The palpebral conjunctivæ were of normal hue, though the vessels appeared somewhat enlarged; tongue and mucous membrane of the mouth presented the same general appearance. Appetite fair, but had increased præcordial oppression after a full meal or the ingestion of liquids. The urine was of a brownish colour; no albumen; a very dark brown shade was given on the addition of an excess of nitric acid, becoming almost black on boiling. Inspection of the chest showed distinct vibration of the intercostal spaces over a large portion of the cardiac area, and palpation strongly impressed one with the violent, struggling action of the organ. Apex impulse below and to the left of the nipple; first sound entirely masked by a loud blowing murmur, most distinct in the third intercostal space on the left side, though audible at the apex; second sound normal; carotid and abdominal pulsation very marked. The blowing murmur audible over the heart was common to all the larger arterial trunks. Percussion showed decided enlargement of the cardiac dulness; pulse 109, full and strong, the vessel feeling double its normal size. Cardiac oppression severe, and increased by slight pressure on the epigastrium and walls of the chest. Firm pressure on the spinous processes of the upper dorsal and lower cervical vertebræ decidedly painful. Muscular sensibility very pronounced, especially in the gastrocnemii and pectoral groups; later, this was observed in the masseters and the muscles of the anterior portion of the forearms and inner sides of the thighs. The œdema of the anterior tibial regions had now become more or less general, a condition probably existing from the first, but less easily demonstrable.

17th June.—Pulse 104. Feels somewhat better, a saline purgative having been administered early in the morning.

18th June.—Pulse 98. Feels worse, and complains very much of the violent action of the heart, even while at complete rest. A sudden fall of the temperature, with rain, had occurred within the last 24 hours.

20th June.—Pulse 90. Is somewhat less oppressed, in consequence of active purgation and draining away of fluids, but he is weaker.

21st June.—Pulse 89. Heart's action still violent. Vomited about 12 oz. of greenish-yellow fluid, which appeared to give temporary relief.

24th June.—No material change since last note; gradual loss of strength; increasing anasarca, especially of the face; skin becoming of a leaden hue.

25th June.—Pulse 110. Vomited several times to-day, and is rapidly sinking. Is very restless; constantly changing his position in vain attempts to obtain relief from the sense of impending suffocation. Crepitant râles appeared in both lungs. The pulse rose to 120, and then disappeared at the wrists; the extremities became cold, and at 12 M. he died rather suddenly.

Postmortem Examination, 24 Hours after Death.—Rigor mortis wanting. Ecchymosed, purplish spots from the size of the finger-nail to that of the hand over the whole surface of the body. Tympanites inconsiderable. Subcutaneous areolar tissue gorged with serum. Intestines moderately distended with gas; colour bright pink, from capillary congestion, and very translucent, PEYER'S and the solitary glands appearing from the outside with a distinctness rarely observed from within. Peritoneal cavity contained about 12 oz. of clear fluid. Lungs œdematous. Left pleural cavity contained 13 oz. clear fluid, right 5½ oz. Pericardium contained 2 oz. of the same clear fluid. Right auricle contained a large firm clot, filling a 2 oz. graduated glass; one half of its surface covered by a firm, white fibrinous substance one-eighth of an inch thick. Right ventricle contained an elongated hourglass-shaped clot, extending through the valve into the pulmonary artery, and in the first and second ramifications of the vessel were small emboli, appearing as if recently detached from the main clot. This was beyond

question an antemortem clot, as indicated by its extreme firmness and by the behaviour of the heart during life. A still further proof of this was the fact that a microscopic examination of the white fibrinous portion revealed a capillary network containing blood corpuscles, not only on its surface, but penetrating its substance.* The left side of the heart contained a small quantity of feebly coagulated blood only. The cardiac valves were all examined with care, and showed no signs of disease. Weight of the organ when empty $14\frac{3}{4}$ oz. The ventricles were dilated, their walls attenuated, and the whole structure wanting in that degree of firmness proper to the normal heart. Microscopic examination demonstrated the muscular substance to have undergone degenerative changes. Stomach contained 8 oz. of greenish-yellow fluid; its mucous membrane showing a number of dark red and purplish spots, giving it a mottled appearance. Spleen small and firm; weight, 5 oz. 6 dr. Liver presented no marked abnormal appearances; weight, $54\frac{1}{2}$ oz. Kidneys: weight, $5\frac{1}{8}$ oz.; dark in colour; capsules free.

Case 2. *Pernicious Beriberi; Death; Autopsy.*—N., æt. 26 years; male, native of Tokio, but had lived for the past 13 years in a provincial town; previous general health good, except for a syphilitic attack. He came to Yokohama in May 1879. First symptoms made their appearance about the 15th August, and by the 24th, the date of coming under observation, all the typical phenomena of a case of wet beriberi had developed.

His general appearance was as follows: complexion, sallow white; lips and gums of their normal pinkish hue; conjunctivæ the same. The whole body presented a bloated, swollen appearance, especially the face and neck. Pulse 95, soft and full; temperature 98°.5 F. He complained of præcordial oppression and palpitation, weakness in the legs, and anæsthesia. In consequence of the œdema, it was difficult to define, by percussion, the size of the heart; its action was somewhat laboured, and there was a loud systolic murmur heard over the base of the organ, to the left of the sternum. Tongue slightly coated; bowels constipated; urine scanty but contained no albumen. For several succeeding days there was no change in the condition. Pulse ranged from 90 to 100 in frequency; temperature from normal to a degree or a fraction below it. He was given highly nourishing food, and an occasional dose of sulphate of magnesia. On the 16th September, when I saw him again, the general anasarca had much increased, and the jugular regions of the neck were swollen out of all proportion to the other parts of the body. The skin of the face was also much distended, giving him on the whole the appearance of a man who had been drowned. The chest oppression had become very severe; coarse bronchial râles were heard over the whole chest, and there was marked dulness on percussion at the base of the lungs, more especially on the right side. The next day, 17th September, he was much worse; pulse 110, and very feeble; intense distress in breathing; enormous swelling of the lateral portions of the neck had obliterated all its form and symmetry. It was remarked at this time that the paralysis of the lower extremities was somewhat less than at an earlier stage of the disease. There was little change from the foregoing symptoms, except in their intensity and gravity, for the two following days, when he expired, the mode of death being by asphyxia, and paralysis of the heart from over-distension.

Postmortem Examination, 24 Hours after Death.—Rigor mortis wanting; excessive general œdema, most marked, however, in the upper portion of the body. The recti presented a peculiar black-greenish colour throughout their whole breadth and length, while the muscular tissue in all other parts of the body preserved its normal pinkish colour. The external appearance of the intestines was somewhat peculiar, some portions showing a bright red arborescent injection (seen also by Praeger), while others were mottled with greenish-grey spots. The peritoneal cavity contained $7\frac{1}{2}$ oz. of clear serum. The mucous surfaces of the stomach and intestines exhibited marked signs of congestion throughout their whole length. Liver: serous and cut surfaces somewhat dark, but otherwise apparently normal; weight, 56 oz. Kidneys: capsule free, general appearance normal. Spleen: size and appearance normal. Right pleura adherent throughout its whole anterior and lower portion, the remaining portion contained 14 oz. of serous fluid. Left pleura entirely free, its cavity containing 27 oz. of clear serous fluid. Lungs: both

* I am aware that this is not only rare, but regarded as impossible by some observers.

Case 2.—Beriberia Hydrops. Appearance presented 2 days before Death.

exceedingly œdematous, a frothy sero-sanguinolent fluid flowing from their cut surfaces, quickly forming considerable pools on the table. Heart: pericardium free, showing no signs of inflammation new or old; its cavity contained 1½ oz. of clear serum. The organ was large and remarkably flaccid, its tissue softened and of a dirty yellow colour. The unusual size of the heart appeared to be due to excentric hypertrophy. The right side contained a small amount of semi-fluid blood; left side empty. Endocardium and valves apparently normal. Microscopic examination of the muscular tissue of the organ showed it to have undergone primary degenerative changes, indicated by the indistinctness of the striations and in many parts their entire obliteration by fine granulations. All the large venous trunks were enormously dilated and filled with clotted blood (accounting for the lateral swelling of the neck always present in the last stages). The secondary divisions of the venous system, as far as could be traced, were also markedly distended and engorged with blood. Brain: a small amount only of sub-arachnoid effusion of serum existed; external appearance of the brain and its membranes otherwise apparently normal. The ventricles contained little or no fluid; cut surfaces of the brain substance firm and apparently normal. The spinal cord was removed with great care. Sub-arachnoid effusion of serum inconsiderable. The nerve substance being exposed, and a stream of water gently poured over it, a partial disintegration and separation of its lumbar portion followed. Sections from the remainder of the cord, hardened in the usual manner, were subjected to a microscopic examination, and appeared perfectly normal.

The following history is not only typical of a case of dry beriberi, but is the most remarkable one in other respects that I have ever met with. The case is notable because the subject was a female, because of the number of successive recurrences or relapses of the disease coincident with three confinements from one to two years apart, and because of the extreme degree of atrophy and paralysis of the extremities, with subsequent apparently complete restoration to health.

Case 3. *Beriberia Atrophia.*—Mrs. M., æt. 33 years, wife of an official of the better class; resides in an elevated, well-drained locality on the side of the bluff facing the town. Was confined with her second child on the 1st July 1873. During the last months of pregnancy had experienced a sense of weight in the lower extremities, and shortness of breath on exertion, more marked than while carrying her other child. Delivery was normal, child well formed and apparently healthy, but it died in three days from causes unknown; the mother's milk disappearing without trouble. During the subsequent ten or twelve days, she frequently complained of constriction of the calves of the legs, and more or less pain on pressure or forced movement in the muscles of the anterior part of the forearm. Occasional feelings of oppression in the præcordia, and slight palpitation were also noted. On attempting to stand at the end of the twelve days mentioned, she found herself quite unable to do so. Her condition from this time became steadily worse; she suffered little when quiet, but muscular movement produced pain. On the 1st September, two months after confinement, she was admitted to the hospital, completely helpless, not being able to extend or flex a limb, or move from side to side unaided. The muscles of the extremities were extremely atrophied, the anterior tibial muscles were paralysed, while those of the calves were much contracted, bringing the foot into a complete talipes position; the dorsal muscles of the forearm were paralysed, and the palmar contracted, bringing the fingers tightly into the hand. Any attempt made to rectify these abnormal positions was productive of great pain. The pulse was small; the heart apparently contracted and acting feebly, and there was present the metallic systolic ring of chronic cases. Tongue clean, appetite fairly good, bowels slightly constipated, urine normal in quantity and quality. She complained of nothing but some constriction of the chest, and palpitation, these varying in degree with atmospheric changes.

At this time I took, with the harpoon, several specimens from the muscles of the calf and from the tibialis anticus for microscopic examination. These showed extreme degeneration of the muscular elements.

A variety of means were with but little success resorted to for her relief, including electricity, strychnia, iron, frictions, and so on. At the end of two months she was transferred to an invalid resort in the mountains, the result being most satisfactory—a change immediately taking place for the better. Four months later she again entered the hospital, being now able to raise herself to a sitting posture and change her position in bed, while the rigid contracted condition of the muscles had partially disappeared, one finger only (the little one) remaining tightly flexed. The former extreme atrophy of the muscles had been followed by a considerable increase in their bulk.

Specimens again taken with the harpoon demonstrated a partial restoration of the primitive muscular elements. After remaining a month longer in the hospital, she returned home. Improvement continued during the following summer and winter months, until she could be up and walk about.

In the meantime she again became pregnant, and in June 1874 was delivered of a healthy child. With this event, the old symptoms returned. Paralysis and atrophy of the partially restored muscles of the limbs followed, and at the end of ten weeks she again entered the hospital. Her condition was not so bad as on the first occasion, as she could turn over in bed unaided, and to some extent move the limbs. The heart symptoms were about the same. Remembering the benefit gained by her sojourn in the mountains, she again spent several months there, with the same decided benefit. Early in the spring she returned home, and, to my surprise, could walk with comparative ease, though unable to quite bring the heel to the floor, in consequence of some remaining contraction of the muscles of the calves. The whole body, including the extremities, was plump and well rounded, and she appeared as well as before her first attack. During the following summer she again became pregnant, and her confinement was followed by a third relapse, but in a much milder degree. From this she readily recovered, going at once to the mountains, and remaining until well.*

Case 4. *Chronic Beriberia Hydrops.*—O., æt. 28, member of one of the feudal families; came to Yokohama in January 1873, to fill an important government position. His family history was good; had suffered from no specific disease, and had previously to this enjoyed good health. Was first seen professionally, 10th June, and his general appearance was quite characteristic of the class of persons subject to this disease, viz., stature medium, body well proportioned, without superabundance of fat, but decidedly plump, muscles well developed and firm. Notwithstanding these general appearances of good health, the skin was of a characteristic sallow hue; in fact, an icterus of a light shade. The conjunctivæ, and mucous membrane of the gums, lips, and tongue were of a dark red colour. He was unable to give the exact date of the invasion of his disease, but stated that at about the end of April, six weeks before, he began to feel unwell, with an occasional sense of feverishness, malaise, and of fatigue in the whole body, though most marked in the legs. There was a corresponding condition of mental languor, with an inability for continued thought, and a constant disposition to postpone the business of to-day until to-morrow. As the season advanced, other special symptoms appeared, such as œdema of the anterior tibial region and anæsthesia of the skin covering the muscles of the tibio-fibular space. Any considerable exertion caused palpitation of the heart and præcordial oppression. Bowels sluggish; urine diminished in quantity; appetite not materially affected, but ingestion of liquids, or a full meal, increased the chest oppression. There was also a tendency to stumble in walking. Inspection of the chest showed distinct vibration over the cardiac region synchronous with the heart's impulse. Epigastric and abdominal pulsation were marked, and pressure even to a moderate degree in the epigastrium was attended by a sense of suffocation. Pressure on the chest, left decubitus, or any force applied so as to interfere with the heart's action, was followed by feelings of great distress. The pulse was normal in frequency, but soft and very markedly wanting in tone, so much so that it gave to the finger the sensation of a fluid propelled through a collapsed indiarubber tube; this is in my experience a pathognomonic symptom of beriberi in certain stages. Percussion showed the heart to be slightly enlarged, and auscultation gave a feeble bellows murmur, limited to the left side of the sternum, third intercostal

* Since that time, now four years, she has not been pregnant, and presents no signs of having ever suffered from the disease, though living in the same locality as when first attacked.

space. The same murmur could be heard in the large arteries. Liver normal in size. Pressure on the muscles in various situations elicited pain, most marked in the calves, the inner side of the thighs, and the pectoral and intercostal groups. Pressure on the spinous processes of the lower cervical and upper dorsal vertebræ gave decided tenderness. Having frequent occasion to see him, it was found that his symptoms and condition were constantly changing, and that certain meteorological variations, more than anything else, contributed to this: thus, a sudden fall of temperature, with rain, especially after a few days of steady, high thermometer, was followed by a marked exaggeration of all his symptoms; sometimes these would be sufficiently severe to compel him to remain at home, or to go to the country until the weather settled again. Increased sluggishness of the bowels was a constant attendant of these exacerbations, but a brisk cathartic administered at these times always produced decided relief of nearly all the symptoms, especially if four or five large watery stools could be obtained. A diuretic mixture was usually given at the same time and kept up for some days, indicated by the scanty flow of urine present. Frequently, if these remedies were used promptly, the patient would recover from this temporary exacerbation quite rapidly, and after a day or two of rest could resume his duties.

In this way the first season was passed, with the addition of a couple of weeks in the mountains during the summer vacation. In the ensuing winter all the symptoms of the disease disappeared, but with the spring they again presented themselves. During the summer months the same periodical exacerbations were experienced, but less frequently and in much less severity; relief being afforded by the means previously employed. With the winter season he again seemed quite recovered. By the third summer the symptoms were fewer and milder still, so that there was less occasion to prescribe even the simple remedies which had before given him relief; and in the fourth year scarcely any traces of the disease remained, omitting those connected with the heart. Even these would have been difficult to recognise by one unacquainted with the history of the case, and all that could be said of the organ was that its action seemed somewhat feeble.

Case 5. *Subacute Beriberia Hydrops.*—H., æt. 19; a student; son of one of the old feudal princes near Kioto, 200 miles distant. Family history good; had never had syphilis or rheumatism, and general health always good. Came to Yokohama to reside nine months ago. Present residence was in second story of a house in good locality. Presented himself at the hospital, 19th April, with the following history and symptoms. He had not been feeling well for some three weeks, but attributed his malaise and general sense of fatigue to a cold. Ten days ago he experienced, after a short walk, an unusual tired feeling in the legs, accompanied by a heaviness and constriction in the muscles of the calves, and, upon exertion, painful palpitation of the heart. Attention being directed to his legs, there was found œdema over the tibiæ, not extending below the malleoli, and numbness of the skin over the tibio-fibular spaces. On walking to the hospital a few days afterwards, he found that the trouble in his legs was worse; that there was, in addition, a peculiar weakness of the knees; and that difficulty was experienced in lifting the toes from the ground, so that very little inequality in the way caused him to stumble.

He was of medium height, rather fleshy, though not corpulent, with all the appearance of being well nourished. Skin slightly sallow, that of the face a little puffy; eyes clear; mucous membranes of normal hue, or possibly a shade darker; tongue clean; appetite but little impaired; digestion good, though he suffered some præcordial oppression on taking a full meal; bowels slightly constipated; urine scanty and of a light amber tint, giving a deep brown with nitric acid in excess—increased by boiling. Intellect clear, but he was indisposed to mental exertion. The œdema, paralysis, and anæsthesia in the legs had considerably increased since the first observation. In addition to the sense of constriction in the muscles of the calves, there was decided tenderness on pressure; this also existed in the muscles of the inner sides of the thighs, and intercostal and pectoral regions. The intercostal spaces over the heart showed a peculiar vibration with the cardiac impulse, with slight lifting of the ribs, indicating much exaggerated action of that organ. A distinct blowing sound, most intense over the third intercostal space to the left of the sternum, was heard with the systole; diastole normal. The same murmur could be heard in the principal arterial trunks.

The cardiac dulness was slightly increased; apex beat most distinct below and one inch to the left of the nipple. Pulse 90, very large and soft.

22nd April.—Pulse 86. He feels worse; the anæsthesia has extended to the lower part of the abdomen; cardiac palpitation and oppression rather increased.

25th April.—Pulse 108. Anæsthesia now surrounds the mouth, and has reached the tips of the fingers.

26th April.—Pulse 100. Suffers from chest oppression and palpitation on the least exertion. Pressure on the epigastrium, even with the tip of the finger, cannot be tolerated, as there is immediate increase of the above symptoms; left decubitus, or any mechanical interference with the action of the heart, producing the same result.

27th April.—Pulse 90. Feels better; relishes his food.

28th April.—Pulse 95. Is worse. Temperature of the atmosphere had suddenly fallen during the night, with rain. Is unable to rise or walk without aid. The anasarca has increased, and the case has assumed a serious aspect.

29th, 30th April.—But little change; takes less nourishment. A brisk cathartic, followed by five or six watery stools, gave marked relief. This was the first instance in which I had used this remedy, the case being one of the earliest under my care and observation. For the next few days there was little change as far as the paralysis and anæsthesia were concerned, though the effect of the cathartics in reducing the effusion which had commenced to collect in the serous cavities and subcutaneous areolar tissue was very apparent. By degrees the other symptoms began to improve, palpitation and præcordial oppression diminished, the heart murmur became less distinct, and the colour of the skin approached its normal hue. As soon as he could be moved he was sent to the mountains, where he ultimately completely recovered.

This, it will be noted, was early in the season not only for a case to appear, but to end in recovery; as ordinarily attacks begin some weeks later, and substantial improvement only commences with the winter months. In this year, however (1873), the disease was of unusual severity, and the early appearance and gravity of the symptoms of this case may thus be accounted for.

I have not thought it necessary to note the daily temperature, as it rarely rose above normal, and often sank a little below it. Although the stages of beriberi may generally be divided into the prodromic, subacute, acute or pernicious, and chronic, it will be seen by a glance at the history of the preceding cases that this is to a certain extent schematic, as the stages often insensibly merge into each other, so that it is difficult to say exactly where one ends and another begins.

As it has been shown that the period of incubation in the vast majority of cases is several weeks, or even months, and that the prodromic period is more or less protracted, it would greatly simplify the consideration of these various stages were the definition already given of the disease as a chronic affection, adhered to, and the acute attacks considered as simple exacerbations of it. Especially is this the case in the dry form, in which the pernicious stage never appears.

Case 6. *Mixed Beriberia Atrophia and Malarial Intermittent.*—M., æt. 24; government officer. Family history good. Has never had any severe disease or syphilis. Came to Yokohama from the country three years ago (1877), in March. In August of the same year, had a mild attack of beriberia atrophia, from which he recovered completely during the winter. Last year, about the same time, the disease again appeared, still in a mild form, which was again recovered from as soon as cold weather set in.

This year (1879), the complaint returned a month earlier than heretofore. The usual train of

symptoms, viz., heaviness in the legs, anæsthesia, muscular tenderness, palpitation, etc., was much more pronounced than in his previous attacks. These continued to worry the patient, without much variation, till the 1st September, when a decided change for the better was experienced, and, considering the lateness of the season, no further serious trouble was anticipated. On the last day of the month, however, when feeling himself nearly free from the disease, he was suddenly seized with a severe chill. This was followed by high fever. On the next day (1st October), another chill occurred at about the same hour, also followed by severe fever and a sharp attack of diarrhœa. The muscles of the calves of the legs were exceedingly painful on pressure or on an attempt at motion, so that he found himself unable to stand or walk. During the night the muscular hypersensibility became general. The abdominal and intercostal groups were especially affected, so that respiration was difficult, and coughing caused intense suffering.

2nd October.—Entered the hospital with same symptoms, and in the condition just described. Temperature: morning, 103° F.; evening, 102°.8. Pulse 136; respiration 42. The chill to-day was not quite so severe as on the two previous occasions; heat and thirst, however, were much complained of; tongue dry and coated; occasional nausea. Ordered a seidlitz powder, to be followed after its operation by 15 gr. of quinine.

3rd October.—Temperature: morning, normal; evening, 100°. Pulse 100; respiration 35. General condition very much better; heat and thirst no longer tormenting; tongue moist; no nausea. No recurrence of the chill. The character of the pulse was that so often observed in beriberi, viz., soft, full, and greatly wanting in tone; systolic murmur very distinct over base of the heart to the right of the sternum. Muscular hypersensibility still general, and unusually pronounced. In this case even the dorsal groups were exceedingly painful on pressure, a condition which I had not observed before in this disease. Respiration still painful, and more or less difficult. Quinine continued. Ordered a diuretic mixture.

4th October.—Temperature: morning, 99°.4; evening, 100°. Did not feel quite so well as yesterday. Character and frequency of pulse unchanged; tongue clean, bright red at the edges; no appetite. Paralysis of the muscular groups, characteristic of beriberi, very pronounced, so much so that the patient was unable to change his position or feed himself. Treatment not changed.

5th October.—Temperature: morning, 99°.4; evening, 101°.5. Pulse 100; respiration 36. No special change, except some increase of thirst towards evening. Treatment same. Nausea ceasing, a fair amount of nourishment was taken, consisting of rice, soup, milk and eggs.

6th October.—Temperature: morning, 100°.9; evening, 101°.6. Pulse 100. Does not feel so well, the sense of weight on the chest and difficulty of breathing greatly increased. Pulse very full and soft. Intercostal cardiac pulsations very much increased, and visible over the whole præcordial region. The systolic murmur, before only heard at the base of the heart, now audible over the entire organ. There was no œdema, however, or signs of serous effusion in any of the cavities. Some increased thirst and sense of feverishness.

The weather, which had been quite warm for several days, had become suddenly cool. A drizzling rain had set in during the night, and the atmosphere was saturated with moisture. It will be seen by the record of this day that the symptoms proper to the beriberi factor in the case had increased in severity far out of proportion to the rise in temperature or other evidences of fever.

I conclude, therefore, that the exacerbation of the special phenomena of beriberi was due alone to the atmospheric changes noted, which play such an important part in the progress of the disease.

7th October.—Temperature: morning, 100°; evening, 99°.9. Pulse 99; respiration 40. No change in the special symptoms of the beriberi element in the case.

9th October.—Temperature: morning, 99°.6; evening, 99°.9. Pulse and respiration same. Ordered 20 gr. quinine, in divided doses.

10th October.—Temperature: morning, 98°.1; evening, 98°.6. Pulse 82; respiration 28. Felt decidedly better in every respect. The muscular hypersensibility appeared less pronounced, and amelioration in the various morbid phenomena referable to the circulatory system was very marked. The bowels being somewhat constipated, an ounce of castor oil was given. Quinine continued.

11th October.—Temperature: morning, 98°; evening, normal. Pulse 80; respiration 30. Less malaise. The paralysis, on the other hand, was more pronounced, though the pain on motion was less. Had for the first time a little appetite. Reduced quinine to 15 gr.

12th October.—No change, except a gradual increase in the paralysis.

13th October.—Temperature: morning, 98°.1; evening, 99°. Pulse 82; respiration 28. Symptoms unchanged. Reduced quinine to 10 gr. A considerable desire for food being expressed, a liberal diet was ordered. The tongue being clean and the secretions little, if any, disturbed, no especial medication other than the quinine was thought necessary.

14th October.—Temperature: morning, 99°.1; evening, 100°. Pulse 70; respiration 30. General condition unchanged. Ordered quinine 20 gr., in divided doses, as before.

15th October.—Temperature: morning, normal; evening, 99°.4. Pulse 85; respiration 28. Felt somewhat better.

17th October.—From this time on, the temperature did not rise above 100°, and all symptoms of fever disappeared, except occasionally towards evening, and even then were very slight. On the 20th the patient declared himself quite well, except for the paralysis affecting the lower extremities and the extensors of the fingers and hand, he being still unable to stand alone or feed himself. A curious anomaly here appeared, in that the index fingers of both hands preserved their power of motion. The sensibility in the balls of the fingers, which had been nearly lost, now began to return. It was observed that this followed immediately on the skin peeling off from them. This is the only case in which I have observed this phenomenon. The paralysis of the muscles of the trunk was the first to diminish, which early enabled him to turn in bed and assume the sitting posture; that of the extremities rapidly disappeared, so that on the 25th he was able to walk, and on the 27th left the hospital for a few days at the baths in the mountains before returning to duty. The only treatment made use of for the relief of the paralysis was friction with turpentine liniment, and kneading of the affected muscles.

This case is one of peculiar interest, as showing most clearly the existence of two distinct and specific poisons of miasmatic origin operative in the same subject at the same time. Among complications of beriberi, the so-called marsh malarial element is not a very serious one, from the fact that in most cases it can be quickly eliminated by the administration of quinine, as shown in this case by the cessation of the periodical chills and the fall of temperature after the first dose of 15 gr.

Case 7. *Mixed Beriberi and Typhoid Fever.*—A., æt. 26; merchant. Was seized on the 5th October with a severe chill, followed by fever and a sharp diarrhœa of 20 or more watery stools in 24 hours. On the 10th the diarrhœa had become much better, the passages being reduced to two or three in 24 hours; feverish symptoms, however, continued.

14th October.—Rather suddenly became much worse; thirst tormenting; appetite lost. These symptoms continued with little variation till the 20th, when he entered the hospital. Temperature taken by the house physican, 103°.1.

21st October.—Temperature: morning, 102°.8. Pulse 100. Patient's expression indicated a serious illness; tongue covered with a thick yellowish-brown coating; thirst severe; entire loss of appetite; diarrhœa somewhat troublesome, consisting of three or four watery stools; right iliac tenderness marked; skin dry, hot, and showing a rose-coloured eruption disappearing on pressure. Pulse 100; soft, full and without tone. A loud systolic murmur over the pulmonary artery, also in the larger vessels; intercostal

Case 7.—Mixed Beriberi and Typhoid Fever (from a Photograph).

pulsation over much of the cardiac region; muscular tenderness more or less general, but most marked in the calves and the pectoral region; abdominal muscles also painful on pressure, especially on the right side. Treatment was directed chiefly to the fever, without regard to the beriberi element in the case. Ordered 2 oz. brandy, with milk and egg; and a diuretic mixture with a sleeping draught. In consequence of gastric irritability, the milk and egg was vomited, even water being rejected. The sedative, however, was retained, and gave the patient a quiet night, which he had not had for some time.

22nd October.—Temperature 103°.8; pulse 100. A sheet, folded so as to cover the chest and abdomen, dipped in iced water, was applied frequently, and the temperature fell to 101°.4. As the patient complained of the treatment it was not continued, and 103°.8 was again reached in the evening. He now complained of great distress referred to the chest and gastric region, which he attempted to relieve by putting his finger down his throat, retching only being produced with little benefit to him. A tormenting cough now set in, accompanied by bronchial râles. Had two loose stools.

23rd October.—Temperature 103°.6; pulse 102. Had less nausea; cough the same; tongue thickly coated and very dry. All the specific symptoms of beriberi unchanged, except that slight drooping of the feet indicated commencing paralysis of the anterior tibial groups. No œdema. In addition to the rose-coloured eruption, a blush of considerable intensity tinged the skin over a great portion of the body. Evening temperature rose to 105°; pulse 120; respiration 38. Tongue still very dry, coating almost black. Was very restless and groaned constantly. Cough even more troublesome than yesterday.

24th October.—Temperature 103°.6; pulse 104; respiration 35. Had slept moderately well after a sleeping draught, and felt somewhat better. Continued the brandy and milk. During the night bled freely from the nose; tongue slightly moist. A new crop of the eruption made its appearance, with fading of the old. Cold pack again applied, and temperature fell to 100°, which lasted for three hours, but it rose again in the evening to 103°.6. Heard with difficulty the ordinary voice; tongue again dry and dark; sordes about the gums. Increased brandy to 3 oz. daily, and repeated the sleeping mixture.

25th October.—Temperature 103°; pulse 98; respiration 35. Appeared much better; tongue a little moist. Cold pack repeated. Temperature fell to 100°.2. Pulse 100. Repeated sleeping mixture.

26th October.—Temperature 103°; pulse 108; respiration 36. General appearance better than yesterday. Cough nearly gone. Tongue had lost its dark colour, and become red and fissured. Wet pack renewed at 9 A.M. Temperature 99°.6, but it rose again at noon to 103°. Pack applied again at 3 P.M., when the thermometer marked 100°.4; during the night, however, it rose to 104°. Pulse 110. Was very restless notwithstanding the sleeping draught. General symptoms about the same, except that the cough returned.

27th October.—Temperature 103°; pulse 112. Symptoms unchanged. Prescribed $\frac{1}{4}$ gr. morphine for the cough. Gurgling in right iliac region. New crop of eruption appearing. Wet pack applied at 1.30 P.M., when the temperature fell to 100°.2, but rose again to 103°.4 in the evening. Pulse 112. During the night, broke out in a profuse perspiration.

28th October.—Temperature: morning, 102°; evening, 102°.4. Pulse 100; full, but weak. Skin bathed in perspiration. The heart murmur which had been loud, commenced to diminish with the appearance of the perspiration, and now was scarcely to be heard. The cough still continued somewhat troublesome.

29th October.—Temperature 100°.6; pulse 102. Symptoms but little changed. The paralysis, however, of the anterior tibial muscles and the contraction of those of the calves had steadily gone on from its first appearance till the foot assumed the characteristic drooping position of the severer forms of dry beriberi. From this time the improvement in the fever symptoms suffered few interruptions; the paralysis and atrophy were also rapidly recovered from, so that when discharged on the 10th November the patient was able to walk with the aid of the nurse.

Analysis of Individual Symptoms.

a. *Symptoms referable to the Skin.*

Colour.—This I have described as sallow-white. Though this term is applied to the colour of the skin in anæmia and various cachexias, in this disease, according to my view, it depends on neither of these conditions. That it is not due to anæmia is evident from the invariable pinkish hue retained by the conjunctivæ and buccal mucous membrane. Examination of the blood in some cases shows an increase in the number of white blood corpuscles, while in others there seems to be no change in their number relatively to the red globules. Still less am I disposed to refer this discolouration of the skin to a cachexia, for in beriberi it is among the earliest conditions observed. The explanation is more probably to be found in circulatory disturbances dependent on vaso-motor derangements.

Anæsthesia.—As will be remembered, this is one of the most characteristic symptoms of beriberi. In nearly all cases it is the first indication of the invasion of the disease, appearing over the anterior tibial muscles, and simultaneously, or a little later, in the tips of the fingers and around the mouth. It not unfrequently happens that for a long time it remains confined to these regions. When spreading beyond or attacking other parts, it uniformly follows the same course. Thus, that of the anterior tibial regions extends up along the inner side of the thighs and across the lower part of the abdomen, rarely as high as the umbilicus. That of the tips of the fingers follows the dorsal surface of the hands and forearms, but stops at the elbows. In exceptional cases only are other areas of skin involved. Its progress is always uniform and symmetrical, and never marked by any discolouration.

b. *Temperature.*

The almost invariable low thermometrical range in uncomplicated cases is commonly noted by all recent observers. So well established is this point that it is of decided diagnostic value in doubtful cases.

c. *Symptoms referable to the Circulatory System.*

Pulse.—Large, soft, or markedly wanting in tone, giving the sensation, as already expressed, of a fluid forced through a spent india-rubber tube. This is characteristic of the subacute and acute stages of wet beriberi, and is often met with in an exaggerated form. This pulse is liable to variations, and is often apparently caused by weather changes, from dry to wet or moist days. In the dry form of the disease the opposite condition is observed, *i.e.*, as regards size and tone, the pulse being in the one case often visible to the eye, while in the other some little care will be necessary to distinguish it by the sense of touch. Not much change is observed in its frequency, except in the severer cases, or during the last stages of the disease. As might be inferred, murmurs are only heard when marked want of tone is present. The same want of tone is noticed in the venous system, especially during the last stage of fatal cases, when the larger trunks become enormously dilated. This may be recognised during life by the

Areas of Anæsthesia in both Forms of Beriberi.

swollen condition of the lateral portions of the neck, in some cases entirely obliterating the inferior maxillary fossæ. Postmortem examination reveals vast distension of the ascending and descending cavæ, and the frequent presence of large clots, due to mechanical pressure from regurgitation consequent on tricuspid insufficiency, and the want of resistance in their walls or coats. In some cases murmurs and pulsations are recognised very early.

Heart.—The morbid phenomena referable to the heart are numerous. Among the most characteristic symptoms, and one of the first recognised by the patient is palpitation. Though most pronounced on making any considerable exertion, it is often painful when lying perfectly quiet in bed. A sense of oppression in the præcordia is at the same time complained of, and is rarely absent in marked cases. An examination of the chest reveals varying degrees of intercostal pulsation, sometimes involving nearly the whole cardiac region. A decided thrill is at these times communicated to the hand, and the apex beat is felt to the left of its normal position. The action of the organ, sensible to the patient and observer, is often tumultuous and even struggling. Percussion reveals an increased area of dulness. Auscultation discloses systolic murmurs most distinct in the third and fourth intercostal spaces at the left of the sternum, and sometimes audible over the entire cardiac region. The postmortem appearances of softening and dilatation of the whole organ are confirmative of all the clinical symptoms above detailed, independent of endocardial or valvular lesions, which have never been found to exist. Aortic and abdominal pulsations are also very frequent. In the earlier stages of the disease the symptoms referable to the heart are variable; on some days nearly absent, to reappear perhaps suddenly with abrupt meteorological changes. In the dry form, and in old or chronic cases, many of the above symptoms are either greatly modified or wanting, this being probably due to less rapid degeneration of the muscular tissue of the organ. It would seem as though in the wet form the heart is first weakened by paresis of the cardiac ganglia, with consequent incomplete emptying of its cavities. This, in connexion with rapid degenerative changes in its muscular tissue, causes the walls to yield to blood pressure, producing dilatation, tricuspid insufficiency with regurgitation, and, as a consequence, capillary stasis and dropsy. Vaso-motor paralysis, acting at the same time on the pulmonary artery and arterioles, and on the large arterial trunks generally, probably gives rise to the murmurs heard in them.

In the dry form of the disease the vaso-motor paralysis is less pronounced, and the degenerative changes in the muscular tissue of the heart slower; hence its atrophy. From this it follows that, instead of a large dilated heart, we have a small weak one with a narrowed tricuspid orifice, rather than distended, little or no intercostal pulsation, and hence less cardiac dulness, no venous regurgitation or capillary stasis.

d. *Symptoms referable to the Respiratory Organs.*

It is not until the last stages of the wet form of the disease that the respiratory organs become involved. The breathing is then fearfully oppressed, causing the patient to resort to every possible expedient to obtain relief; the countenance is anxious and cyanotic. Dulness will now be found to a considerable extent over the whole chest, with coarse bronchial râles, a purely consecutive condition dependent on œdema filling the lungs in common with all the organs of the body.

e. *Symptoms referable to the Digestive System.*

There is but little change in the appearance of the tongue, except when the disease is complicated with some febrile disorder, or in the last stages of the severer cases.

The appetite is not much impaired in the milder forms of the disease, and continues moderately good even after the symptoms indicate considerable danger. Some cases have been observed where a morbid craving for food has been gratified by a large meal, which has been followed by a speedy death, probably from upward pressure on the diaphragm and overthrow of a weakened and dilated heart. There is scarcely ever any nausea except in the later stages, and vomiting is always indicative of a rapidly fatal issue. The bowels are constipated in the wet form of the disease, but little deranged in this respect in dry beriberi. Watery or dysenteric discharges usually indicate that the case is a complicated one.

Liver.—In some cases there is slight tenderness on pressure only; jaundice and other symptoms of hepatic derangement are absent.

Spleen.—There are no morbid symptoms referable to this organ, according to my observations.

f. *Symptoms referable to the Urinary Organs.*

In the wet form of the disease the urine is always less in quantity than normal. It is rarely high coloured and is without albumen. I have often noticed that on boiling with an excess of nitric acid, it assumes an almost black appearance, which may be due to bile or blood pigment. In the dry form the urinary secretion presents nothing abnormal in quantity or quality.

g. *Symptoms referable to the Nervous System.*

Mental Faculties.—These are preserved intact throughout the course of the disease in all its forms and stages.

Paralysis.—The cause of the paralysis in beriberi is a question by no means yet settled. The opinion, so far as I am aware, is universal that the cause is seated in the nervous system, more particularly in the spinal cord. With this idea, whenever opportunity has been had for postmortem examination, especial attention has been given to the condition of those parts, by which an explanation could be offered of the morbid nervous phenomena of the disease. By the authors already quoted, serous effusion was found in the subarachnoid spaces of the brain and spinal cord, and in the ventricles; by some, congestion of the meninges was noted. By far the most important anatomical lesion recorded, however, is softening of the cord, and it is impossible to deny that a condition resembling softening has been found in many of the autopsies made. In general, such evidence justifies the conclusion of its antemortem existence, and a train of clinical symptoms will have been found to attend its invasion and progress, such as fever, pain along the spine, convulsions, bladder disturbances, morbid conditions of the sexual organs, obstinate constipation or loss of power in the sphincters, bed sores, and in severe cases complete paraplegia. In beriberi none of these conditions exist; even in fatal cases

the degree of paralysis is not in accordance with the gravity of the other symptoms. In a case where I found softening, the power to move the lower extremities appeared to improve during the last days of life. In the dry form of the disease the severity of the other symptoms is not in proportion to the paralysis and atrophy, these latter often being extreme, while the usual symptoms attendant on a mild degree of organic change of the cord are wanting. An important point in this connexion is the fact that however far advanced these conditions of atrophy and paralysis may be, they are in a majority of cases completely recovered from in a short time. In view of these facts, I am strongly disposed to regard the condition of softening as not antemortem, but as consecutive to serous imbibition (as is observed by GINTRAC, and similarly in chlorosis by SANDRAS and EISENMANN*), taking place during the last moments of life or after death, when the vital forces no longer oppose themselves to the mechanical disintegrating power of the fluid with which the nervous as well as all the other tissues and organs of the body are engorged.

The affected muscles themselves remain now to be studied in searching for the seat of the morbid phenomena they present, paralysis, atrophy, etc. Nowhere in the literature of the subject do I find the possibility of their myopathic origin taken into serious consideration, attention having been absorbed by the idea of their neuropathic source. From an early period in my observations, however, I was impressed with the fact that the clinical symptoms specially referable to the muscular system were not dependent on primary derangements of the motor nerve centres or the conducting trunks, consequently I took every opportunity of examining specimens from living subjects at various stages of the disease, as well as those obtained at autopsies. In a considerable number of cases I succeeded in overcoming the prejudices of patients against being harpooned for this purpose, with the result that whenever there was paralysis, however slight, muscular degenerative changes were found to exist. The importance of this fact warrants the following recapitulation of the studies made on the muscular tissues: 1. The anatomical changes were in exact relation to the degree of paralysis and atrophy (this was true not only of the degree of change in the individual fibres, but of the number of those affected in the secondary bundles); 2. Specimens from the wet form of the disease, especially those obtained at autopsies, showed different degrees of commencing degeneration in different groups of muscles, from simple indistinctness of the striations to their total eclipse by a nearly homogeneous cloud of minute granulations.

In few cases of the wet form do the muscular degenerative changes pass beyond this stage, which accounts for the absence of atrophy and the often rapid disappearance of the paralysis, while in the dry form the complete emptying of a certain number of sarcolemma sheaths accounts for the extreme atrophy and paralysis, and the consequent slower recovery.

Still more important are the degenerative changes found to have been sustained by the heart muscle. In my first autopsy, owing to the season and the difficulties attending its performance, the microscopic appearances were not satisfactorily determined, though sufficiently well to say that a marked change had already taken place in the histological elements, while the whole organ had assumed a yellow flabby look. In my second case scarcely a fibre of the

* JACCOUD: *Les Paraplégies et l'Ataxie du mouvement*, p. 440.

muscular structure was normal, all having undergone granular metamorphosis, to the total obliteration of the striations.

In all the electrical experiments made on the voluntary muscles the degree of excitability was in the inverse ratio to the pathological changes they had undergone.

h. *Muscular Hyperæsthesia or Tenderness.*

This is a constant symptom in both forms of beriberi. Its usual location in special groups of muscles has already been mentioned. In a certain number of cases, however, it is more or less general, though often not complained of unless sought for by pressure. This general muscular sensibility may be so pronounced that the patient is perfectly helpless, because of the pain produced by the least attempt at active motion (Case 6, and that of the student already referred to in detail, are striking examples of this). When affecting the respiratory groups it no doubt plays an important rôle in the oppression experienced.

The sudden appearance and disappearance, or diminution, of muscular hyperæsthesia, often observed, is most difficult of explanation. No more so, however, than of some of the other characteristic phenomena of this disease, such as the anæsthesia of the skin, heart palpitation, etc. They would appear to indicate that the exciting cause gives rise primarily to functional, trophic and vaso-motor derangements, to be succeeded on prolonged exposure to its influence by anatomical changes, especially observed in the muscular tissue. This theory is supported by the fact of the rapid amelioration of all the symptoms, often observed on a removal of the patient from beyond the influence of the poison, and their equally quick return on his being again brought within its reach.

The symptoms furnished by the affected muscles, especially those of the calves of the legs, viz., a sense of swelling, tension or hardening, contraction, occasional spasms, and often severe pain on pressure or motion, would appear to indicate the existence of some active or acute process going on within them. If so, the symptoms of excessive hyperæsthesia occasionally observed in all the muscles of the body would be susceptible of the same explanation. Should this be admitted, we have presented the extraordinary phenomenon of a generalised inflammation of muscular tissue. I only suggest this as a possible explanation of the symptoms, though I am at a loss to account for their often transient nature, if from this cause. A somewhat remarkable fact may be mentioned in this connexion, viz., that the muscular groups which first give evidence of loss of power (the anterior tibial muscles and flexors of the hand) are never painful on pressure.

i. *Dropsy.*

As a symptom of beriberi dropsy is confined to the wet form of the disease. Its first appearance over the anterior tibial region is indicated by pitting on pressure. The usually plump appearance of patients is probably due to a moderate degree of general subcutaneous infiltration. In most cases the amount of effusion remains inconsiderable for days, and even weeks. Effusion into the serous cavities cannot be detected at these times, and it is doubtful whether any exists, as its amount, even in the last stages attended by enormous subcutaneous

swelling, is relatively small. It does not appear in the feet and ankle still late in the disease, when the dropsy is quite general.

HOFFMAN speaks of local areas of œdema on the trunk. This I have never seen, nor is it noted by any other observer. A rapid increase of the œdema is always indicative of danger. Its character is much the same as is observed in renal affections, though albumen is never found in the urine. In Case 2 the swelling appeared relatively greater above the diaphragm, and that of the sides of the neck was much exaggerated, though this latter was chiefly due to dilatation of the veins. The connective tissue of the lungs being likewise engorged with serum, respiration is impaired, imperfect aeration of the blood follows, and death, chiefly from asphyxia. The primary cause of the dropsy is a watery condition of the blood. The causes which give rise to the escape of its serum through the capillaries into the surrounding tissues are doubtless various. As vaso-motor paralysis is an important condition, especially in the wet form of beriberi, this plays an important part in the exosmosis of the fluid portion of the blood. The most important rôle in this phenomenon, is however, I believe played by the dilated heart through the mechanism before described.

MASKED, ANOMALOUS, AND COMPLICATED FORMS OF BERIBERI.

From the striking resemblance already shown to exist between the mode of action of the materies morbi of beriberi and that of marsh malarial affections, a somewhat wide range of masked, anomalous and complicated forms of the former would seem almost of necessity to occur.

a. *Masked Beriberi.*

In the localities and seasons of the prevalence of beriberi, many cases furnishing obscure symptoms of a nervous character are constantly met with, especially those giving evidence of vaso-motor nerve disturbance, which no doubt are due to the influence of the beriberi miasm. Unfortunately, we have not, as in masked or doubtful malarial affections, a specific drug by means of which uncertainties of this kind may be cleared up. Our only course in these cases is to await the development of one or more symptoms characteristic of the disease. As a rule, no one symptom occurs alone, but a group of them, in nearly equal degrees of severity. I have observed that during the prevalence of beriberi many patients complain of pains in the pectoral muscles and of chest oppression when no other symptoms of the disease can be made out. I am quite certain that these are masked cases of beriberi, as I have not unfrequently seen them, later on, develop other symptoms, which left no doubt as to their nature. Further investigation will doubtless lead to the discovery of other masked forms of this disease.

b. *Anomalous Cases.*

Anomalous cases, or those presenting marked deviations in type, are by no means uncommon, and often very puzzling to even those who have had large experience of the disease. Thus, I have at the present time a patient in hospital whose only symptom for a

time was anæsthesia affecting the skin of nearly the entire body. On careful inquiry it was found that its first appearance was on the areas of its primary manifestations in typical cases, from which it had radiated to surrounding parts. A little later the characteristic paralysis of the extremities made its appearance, which, coupled with the fact that the patient had suffered from a severe attack of beriberi the previous season, left no longer room for doubt as to the nature of the disease with which I had to do. In others, muscular tenderness is found to be the most pronounced symptom. Such a case came under my observation last year. The subject was a student of this hospital. Having missed him for a few days, I went to his lodgings to ascertain the cause, and found him in bed, unable to move a muscle without great pain, which he attributed to articular rheumatism. I soon found out, however, that the trouble was not in the joints, but in the muscles, which accounted for the pain experienced when motion was attempted. This symptom bore no relation to the others characteristic of the disease. A brisk purgation for a couple of days so improved his condition that he was able to walk, and a week later he renewed his attendance at the hospital.

In a few instances I have seen death follow quickly on the first symptoms of invasion apparently from the overwhelming effects of the poison on the nerves supplying the heart. In these cases the usual mode of death from œdema of the lungs is probably supplanted by pulmonary embolism, a not unfrequent cause of death, mentioned by Indian observers.

c. *Complications with other Diseases.*

Those with which I have found beriberi most frequently complicated are diarrhœa, dysentery, continued and marsh malarial fevers.

Diarrhœa.—When this is the complicating disease, it usually appears a day or two in advance of any well-marked symptoms of beriberi. It often happens that the discharges from the bowels, which are profuse and watery, cease within 24 or 36 hours, without treatment, when the patient finds himself unable to stand or walk. The diarrhœa often returns, exhausting the patient and hastening a fatal termination.

Dysentery.—This I have seen in but two cases, both of which terminated fatally. Dr. WHEELER, who was for a time in charge of the Imperial Naval Hospital in Tokio, informs me that he saw quite a number of cases of this complication. Doubtless the reason I have not met with more of them is that dysentery is comparatively rare in Yokohama.

Marsh Malarial Fevers.—Notwithstanding the strong resemblance which exists between the modes of production of these two forms of disease, their admixture is uncommon. They have a certain resemblance in their initial stages which is very puzzling, and though we may be able to diagnose with certainty beriberi or malarial poison as the cause of the indisposition, nothing but the administration of quinine will for some days enable us to decide which it is. Should it turn out to be a mixed one, this treatment will eliminate the malarial element and leave the beriberi to run its course, but in no way modify it. This alone goes to prove what has been already stated in regard to the distinct nature of the two poisons.

Case 6 illustrates the peculiarities of this admixture, and precludes any necessity for its description here.

Typhoid Fever.—This complication is very frequent and offers one of the most interesting studies in the diseases of this country. It is often difficult, and even impossible, to determine which is the primary invading affection, especially if the patient is late in coming under observation. I have seen cases wherein a patient, after having for some time suffered from beriberi, was attacked with typical typhoid fever, which ran its course and left the primary affection more or less modified in form, but still holding the subject within its grasp. On the other hand, and quite as frequently, I have seen the first symptoms of beriberi appear after the fever had fairly become established. Whether the fever or the beriberi be the first to appear the union of the two justifies an unfavourable prognosis, due mainly to the fact that degenerative changes in the muscular tissue of the heart accompany both, and hence early failure of that organ. When beriberi is first to invade, we have a good diagnostic sign of a complicating specific fever in the temperature, which usually remains normal, or falls below normal in simple cases of the former. The diagnosis is less easy when the fever is the first to invade, in which case the beriberi element is often not detected: 1st, because the patient is prostrate in bed, when the paralysis is overlooked; 2nd, because the dulness of his perceptions renders him unable to appreciate the anæsthesia or to describe the chest oppression and palpitation, whichare characteristic symptoms of beriberi. Signs of pain caused by firm pressure on the calves, even when the patient is in a semi-unconscious state, generally serve to excite suspicion as to the mixed nature of the disease. An examination of the circulatory system usually throws still more light on the case. The pulse is found wanting in tone, and heart and arterial murmurs are more or less pronounced. Intercostal pulsation in the cardiac region will also be seen in the majority of cases. The pain produced by pressure on the abdominal muscles, which is also often present, is calculated to mislead the observer when searching after the symptoms of typhoid fever; its existence, however, in the left as well as the right iliac region will leave no longer room for doubt as to its independence of intestinal lesions. At the same time it adds to the difficulty of diagnosing a typhoid fever complication, as on several occasions I have seen, for the same reason, simple fever mistaken for typhoid when the case was one of the former and beriberi. The paralysis of the anterior tibial muscles, so characteristic of beriberi, is easily recognised in complicated cases, even when the patient is confined to his bed, by the peculiar drooping of the foot, most marked when lying on the back, and is a diagnostic sign of great value. In the early stages of fever complications with beriberi, the thermometer is often our only means of recognising the fact.

Should the patient survive a mixture of a specific fever and beriberi, especially the dry form, recovery is pretty sure to be tedious, as, whichever may have been the first to invade, the beriberi element will remain, if not active, at least as a sequence in the form of extreme muscular atrophy and paralysis of the extremities. Though this condition is sometimes met with as a sequence of uncompliated typhoid it is impossible to mistake a simple case of this disease for one complicated with beriberi.

An illustration of the behaviour of a case of mixed beriberi and typhoid fever, and the peculiarities of its course, will be found in Case 7. Mixed beriberi and simple continued fever, of which I have seen a number of cases, offers little for especial observation beyond what has been noted when typhoid fever is the complicating element, except that a much more favourable

prognosis is warranted. The gravity in either case is much greater in the wet than in the dry form of the malady.

Prevalence of Beriberi within the Empire of Japan.

In Japan beriberi is confined almost entirely to the seaboard towns on the eastern and southern coasts especially since the congregation in them of sailors, soldiers, and students. The inland city of Kioto and the seaport of Kagoshima are apparent exceptions to this rule, as the disease is more or less prevalent in the former, and to but a very small extent, if at all, in Kagoshima, though the latter occupies the most southern extremity of the Japanese group of islands, where climate would appear to favour the development of the disease. Hakodadi, on the other hand, in the island of Yesso, the most northerly of the group forming the empire, suffers severely. The climate here is that of the northern temperate zone of America, hence the theory that this disease is one of warm latitudes only, falls to the ground.

Judging, then, by the geographical range of beriberi in Japan, it is not the degree of heat that determines its prevalence so much as that of atmospheric humidity, which is very great on the southern and eastern sides of the archipelago, while the northern and western shores, which are comparatively exempt from the disease, have a dry atmosphere. I am disposed to believe that the same condition of prevalence or non-prevalence of beriberi in other localities where it exists will be found to admit of the same explanation.

The influence of the season of the year, and of unusual rains, has already been sufficiently considered. But an explanation is still wanting for the epidemic appearance of the disease from time to time. None the less so for epidemic outbursts of marsh malarial affections, which are well known to occur without any recognisable causes other than those always present.

Of the relative endemic or epidemic prevalence of beriberi among the civil population of a given locality in a given time, it is impossible to form an estimate with our present means of obtaining statistical information. The army and navy reports furnish some very reliable and interesting statistics on this subject, by which it will be seen that soldiers and sailors are especially liable to the disease. Thus the military and naval hospitals of Tokio show, in their reports for 1875, that the admissions for beriberi were 660, or 3.8 per cent. of the whole force of 17,000. Besides these cases, a large number of men were invalided as suffering from the disease, but from the mildness of the symptoms were not sent to the hospital.

Diagnosis of Beriberi.

Making all due allowance for the greater prevalence of anæmia and debility from various causes in hot climates, it is difficult to understand how such a variety of opinions as I have already quoted could be held by so many medical men in regard to the nature of a specific disease like beriberi; in other words, how they could fail to make a diagnosis between it and the various other affections mentioned. It is evident that either their opportunities for observation were limited, or that they had very imperfect notions of its symptoms and pathology. With our present knowledge of the disease, such errors would be inexcusable, especially in those localities where it continually prevails. No small degree of experience, however, is needed to recognise it in its earlier stages, or when complicated with other maladies.

Those affections with which beriberi is most frequently confounded are organic diseases of the heart, dropsies, paralyses and muscular atrophies, scurvy and leprosy. The following list of differential characters will serve to simplify the question in the majority of cases where any doubt exists on the subject. Beriberi is distinguished:—

a. *From Organic Diseases of the Heart.*—By the transient character of the murmurs, and their location of greatest intensity over the pulmonary valves.

b. *From Dropsies*, dependent on diseases of the heart, kidneys, or liver, or on cachexias.—By the late appearance of anasarca in the feet, and the relatively small amount of ascites; the absence of albumen in the urine; the general diffusion of the swelling and the small amount of peritoneal effusion; and by the absence of anæmia except late in the disease.

c. *From various Forms of Paralysis and Muscular Atrophy*, dependent on acute or chronic inflammation of the brain or cord, and their meninges, tumours, ataxia; or on progressive muscular atrophy; or on muscular atrophy from the above causes.—By the absence of pain, fever and convulsions, general freedom of motion of the limbs from side to side, control over sphincters, and absence of bed sores; by paralysis and atrophy always appearing first in the lower extremities, and symmetrically; and by the rapid and, in nearly all cases, complete restoration of the volume and function of muscles affected.

d. *From Anæsthesia*, dependent on leprosy, which occurs in rounded, circumscribed spots on various parts of the body, and is from the first most marked on the soles of the feet.—By its symmetrical distribution and regularly progressive course, and by its never commencing on the soles of the feet.

e. *From Skin Abnormalities*, dependent on leprosy.—By absence of clubbing of the fingers and toes, bullæ, ulcerations, etc., and by there being no discolouration of the skin, or tubercular tendency.

f. *From Scurvy.*—By absence of buccal fœtor, and of petechiæ and other blood extravasations.

Prognosis and Mortality.

The *Prognosis* in uncomplicated beriberi is favourable in the majority of cases. In seasons of epidemic prevalence all cases of the wet form must be carefully watched, as it not unfrequently happens that grave symptoms suddenly appear at a time when no danger has been anticipated. An unfavourable prognosis may be ventured when relief is not obtained by free purging, or when vomiting has set in. In the dry form the termination by death is exceedingly rare, and the time when recovery shall take place depends on the degree of atrophy and muscular paralysis present. Appropriate treatment shortens this time, by an arrest of the degenerative changes going on in the special groups of muscles affected. In most cases the reaction of regeneration restores their functions so completely as to leave little or no evidence of the disease.

It is a question of no little importance how far the heart regains its normal condition after having suffered from degenerative changes, as unquestionably it does in many cases of the dry as well as of the wet form of the disease, though no opportunity has been had of verifying this assertion by a postmortem examination. Repeated physical examinations of the heart after more or less complete restoration of the voluntary muscles has taken place, enable me to state with a good deal of certainty that in many cases it is smaller and weaker than normal, though, without doubt, the regenerative force so remarkably exhibited in the same tissue elsewhere does much to correct the injury it may have sustained.

Mortality.—The exact ratio of mortality in a given number of cases of beriberi cannot be estimated in civil life, because of the incompleteness, and even total absence in many localities, of mortuary returns. In years of great severity of the disease, showing, necessarily, a greater intensity of the poison, the death rate is higher than when the number of cases justifies the term endemic only to be used in regard to it. There can be no doubt that the mortality is much less among the acclimatised than among those who from any cause take up their residence temporarily in the localities of the prevalence of the disease. As soldiers and sailors belong mainly to the latter class, some allowance must be made for the high rate of mortality shown by the naval and military reports. Thus, out of 402 cases of beriberi treated in the Military Hospital of Tokio in 1875, 89, or 22.13 per cent., were fatal. In the Naval Hospital in the same city, out of 590 cases treated for this disease from 1874 to 1878 inclusive, the death rate was 5.8 per cent. The army returns for the whole of Japan for 1875, a fairly average year, show a mortality of 17.65 per cent. of the cases treated in hospitals. Of the 218 cases admitted into the Police Hospital in Yokohama in 1871 (whole force 500), 11 only were fatal, about 5 per cent. Some authors put the rate of mortality from beriberi in India at from 14 to 36 per cent., and in southern Brazil it is said to have reached 25 per cent.

Pathological Anatomy.

Considering the large opportunities enjoyed by the Indian medical men, it appears somewhat remarkable that so little has been furnished by them towards the pathological anatomy of beriberi. Excepting the postmortem examinations described in the essays of Praeger and Anderson, I find nowhere in the literature of the malady within my reach more than meagre and disconnected statements of the anatomical changes observed. Great allowance must be made for the difficulty experienced in obtaining autopsies of natives throughout all these Eastern countries, due mainly to religion, custom and tradition. In two cases only have I succeeded in this much-desired object. Other observers of the disease in this country have not been more fortunate in this respect than myself. Dr. Anderson, out of 60 deaths in his recorded cases, obtained one autopsy, and Drs. Eldridge and Berry obtained two.

The following is a summary of the postmortem appearances furnished by my two cases (1 and 2, already detailed) supplemented from all other available sources.

General Aspect of the Cadaver:—Ecchymosed, purplish, or with patches from the size of the finger-nail to that of the hand over the whole body (Anderson). All the muscles well nourished and largely developed (Anderson). Rigor mortis wanting (Praeger). Connective tissue engorged with serum.

Thorax.—Lungs œdematous, bronchial tubes and air cells containing a frothy serous fluid (Anderson). Pleural cavities contain considerable quantities of serous fluid, as noted by most observers. Pericardium contains serous fluid, also noted by most observers. Heart large and flabby; cavities dilated, especially on the right side. Muscular tissue pale yellow in colour, and softened; valves normal (Praeger). This is the testimony of nearly all observers. Anderson, however, states that in his case the muscular tissue of the heart was firm and healthy, and accounts in general for apparent degeneration of the cardiac muscular fibres by assuming the

accidental coexistence of some defect of nutrition. Auricles and ventricles engorged with blood, especially on the right side; antemortem clots in Case 1 extending through the pulmonary valves, with emboli blocking up a number of the secondary branches of the pulmonary artery (Not improbable that death may be due to embolism.—AITKEN). Microscopic examination of the heart muscle in both my cases showed granular degeneration (not elsewhere noted).

Blood vessels.—The whole venous system enormously enlarged and engorged with blood, some of the larger divisions containing firm clots. Nothing abnormal observed in the arteries.

Abdomen.—Intestines exceedingly transparent and of a bright pinkish hue, from capillary congestion (congestion in the form of arborescence.—PRAEGER; mucous surfaces congested and divested of epithelium throughout their whole extent.—ANDERSON). Cavity of the peritoneum free from adhesions, containing clear fluid. Many observers make mention of serous fluid occurring in all the serous cavities. In neither of my cases did the liver present marked abnormality. It is usually described by authors as voluminous and filled with dark blood; but this may perhaps be due to the fact that the subjects were inhabitants of tropical and malarious climates. The spleen presented no abnormality. Authorities speak of this organ as generally large or hypertrophied, very often soft, and filled with black blood. The same reasons may be advanced for this as for the similar condition observed in the liver. The kidneys were normal in appearance, size and consistence. Other observers describe enlargement and softening. DAMMANN states that grave cases give indications of Bright's disease, and BAUER found in them granular exudations (?) and a partial fatty transformation of the epithelial cells of the tubules and glomeruli. In Case 1 I found what I at first supposed to be this condition; but when the specimens were left in glycerine for a few hours, the appearance was lost. I concluded, consequently, that it was due to pigment only.

The *Muscles* are somewhat wanting in firmness, yet preserve their normal size. Colour a little paler than usual. Microscopic examination of specimens from Case 1 was missed through the carelessness of an assistant. The paralysed muscles from Case 2 were examined with great care. All had suffered commencing degenerative changes, though in some instances these had not passed the stage of simple indistinctness of the striations. In the dry form when muscular atrophy and paralysis are often extreme, degenerative changes are far more pronounced. As beriberia atrophia is very rarely fatal, study of the muscular tissue, if pursued pat all, must be from specimens obtained by the harpoon or otherwise on the living subject. These I have succeeded in obtaining in a number of instances. Case 3, which was remarkable not only for extreme atrophy of the muscles of the extremities, but for their complete restoration, exhibited all the phases of muscular degeneration, viz., first, augmentation in the volume of a certain number of the primitive fibres, then obliteration of their striations, and, subsequently, vitreous transformation of their sarcous elements. Some observers have found the muscles in a condition of fatty degeneration; others remark that the tissue often presents the appearance of having been macerated.

Nervous System.—So many clinical symptoms point to a nervous origin that authors have usually given the morbid anatomy of this tissue considerable attention. The following is a brief summary of previously reported observations as well as of my own.

Extravasations of blood have been found on the outer surface of the spinal dura mater in the cervical region. There is a general agreement as to the congestion of the spinal membranes, and the presence of fluid within the canal. The arachnoid has been described as undergoing fatty transformation, and the pia mater as cloudy. Softening has been observed in all three regions of the cord, the lumbar portion and cauda equina being the least frequently affected. In the neighbourhood of the softening the fibres and cells are filled with corpora amylacea. The cord may also be altered by minute effusions of fluid into its substance or by coagulation within its vessels. But outside the distinctly affected regions the microscopical appearances betray no abnormality. The cerebral membranes are sometimes, but not always congested, and there may or may not be effusion beneath them or into the ventricles. The cortex may be normal in appearance or slightly congested. The brain is firm on section and is not softened. On microscopical examination no change is found in the tissue, but the capillary vessels are unusually distinct though empty, and collapsed in a very irregular manner as after great over-distension. Solar plexus and semilunar ganglia apparently healthy. Nerve trunks of limbs normal. Dr. ANDERSON remarks that microscopic examination of the various tissues showed a complete absence of textural lesion.

TREATMENT OF BERIBERI.

From the manifest influence which locality has on the production of the disease, its treatment must be divided into hygienic and medical.

Of the hygienic treatment, the most important, as has already been demonstrated in the chapter on etiology, is removal from the influence of the poison. It is manifestly the duty of the physician, therefore, in all cases to advise this measure; of course, the sooner this is done the more certainly a favourable result may be expected.

If early in the season, and the number of cases be few, the sufferer with the dry form of the disease may safely defer a removal for some weeks, or perhaps months. If, on the contrary, warm weather has already set in, and the disease is epidemic, and the characteristic symptoms of the wet form have declared themselves, or if in any given case a sudden exaggeration of symptoms takes place, no time is to be lost in removing the patient to a safe distance from the locality where the disease was contracted. From the frequently limited area of prevalence of beriberi, this may be but a few miles. The influence of a high temperature on the malady renders it advisable to ascend mountains, thereby moreover securing greater purity of air. The importance of this can only be realised by those who have seen cases where no immediate danger was apprehended suddenly become too ill to be moved, and in a few hours terminate fatally, in spite of all the means at our command. In the dry form of the disease this rarely occurs, though a scarcely less disastrous result may follow in the shape of complete paralysis of the extremities, which may require months to overcome by the best-directed treatment. It is evident from this that to admit a patient suffering with beriberi to a hospital located within a region of its prevalence is culpable in the extreme; so also is it clear that to establish a hospital for the treatment of this disease in such a place is a mistake for which no apology can be made. On general principles, the same may be said of teaching institutions for students

from the country. A normal school was so placed in this district, and 50 per cent. of the whole number of scholars were invalided for beriberi alone in one season. Though the influence of crowding in dormitories, barracks, and low, damp localities within beriberi districts is, according to my view, but a predisposing cause, the removal of patients to well ventilated, airy apartments on high, dry ground is a valuable hygienic measure which naturally suggests itself; yet it would appear at times to have but little influence in arresting the progress of the disease.

Diet.—The proper regulation of food is a hygienic measure of undoubted value. At the head of the list of articles to be avoided is rice. This alone has been charged with being the exciting cause of the disease in countries where it prevails most, principally for the reason that, so far as yet known, it forms the chief article of food consumed by the great mass of the population. How or in what manner it acts deleteriously I am unable to explain, except that it is less digestible and more constipating than the coarser cereals in use. It is possible that this may depend in some degree upon the manner in which rice is prepared, viz., by entirely depriving it of its outer skin or hull—the universal custom in this country. Be this as it may, when barley, wheat or beans are substituted in the diet of patients, an amelioration may be confidently expected. Though this is most marked in the earlier stages and the milder forms, it is none the less a fact that, as long as any food can be taken at all, rice is badly borne. Wheat, barley and beans (especially a small red variety called *adzuke)* are mentioned, because these are used as a substitute for rice by the people themselves. Better assimilation, and a slight laxative effect follow the ingestion of these substances. Especially is this to be said of the little red bean referred to, which moreover excites the secretion of the kidneys. Hence it is that often the only treatment adopted by the people is an exclusive use of this bean as food, and, it must be added, with quite satisfactory results in many cases. Impressed with the value of this auxiliary, I invariably request my patients to use it as the principal article of diet. In mild cases it is only necessary to advise the admixture of the bean with rice. As far as I am able to judge, the virtue of the *adzuke* bean is chiefly in the hull, which has suggested to me the practicability of making an extract or infusion of it for therapeutic use.

Medical Treatment.—No drug has been discovered possessing specific properties in this disease. In the wet form treatment consists in the administration of medicines calculated to draw off the excess of serum in the areolar tissue and serous cavities. First in point of efficacy to this end are the hydragogue cathartics. On account of cheapness, efficacy, and because well borne by the stomach, sulphate of magnesia has been most employed by myself. In mild cases, from 1 to 2 oz. daily suffices. When symptoms are urgent, nothing short of from four to six large watery stools will make much impression, and to obtain these 3 oz. a day, largely diluted, may be found necessary. The sense of relief following this method of depletion is often very remarkable. I was first made aware of this in a case where 4 oz. was taken at once by a patient, instead of in two days as directed. A decided impression having once been made, smaller doses at longer intervals often keep the patient comfortable, and in many cases give a decided check to the disease, to be followed by recovery. In the later and severer stages the stomach becomes irritable, causing the rejection of water or the simplest drinks, much more large saline draughts. The Japanese term this condition *shiyoshin,* the word conveying the idea that the disease has centred in the chest. Elaterium and that class of cathartics must now come promptly into play

if the patient is to gain anything by depletion, care being very necessary that he is not depressed dangerously by their violent action. It is under these circumstances that Dr. ANDERSON strongly recommends large and repeated bleedings. Should this urgent condition be thus relieved, the physician must be prepared to see it return in a few days, or perhaps hours,—and again bleed. After two or three such paroxysms the patient may either recover, or sink into complete exhaustion. As death usually occurs through failure of the heart, combined with œdema of the lungs, the treatment by cathartics, to be effectual, must be begun early, though the rapidity with which extreme hydræmia sets in, in some cases, precludes its successful application. The almost specific virtue claimed for *treeak farook* by Indian physicians is without doubt due to its cathartic properties. I am of the opinion that any other compound producing three or four loose stools would be equally effective. Diuretics are indicated for the same reason as cathartics. A mixture of nitrate and acetate of potash, half a drachm of the former to one drachm of the latter daily, is a favourite prescription with me to excite the action of the kidneys. In mild cases, the acetate alone not only acts well, but is less objectionable for prolonged use than when combined with the nitrate. Jaborandi or pilocarpin has been used in a few cases, but, so far as I can learn, with indifferent success. I have not had any experience with the drug, fearing its depressing action on the heart, and bearing in mind that this organ, in most cases, is weak and strained to the utmost.

Muscular hyperæsthesia and paralysis are common to both forms of the disease. In the wet form, especially in its subacute stage, both the hyperæsthesia and paralysis improve under the depletory treatment by cathartics and diuretics. In the dry form this mode of treatment exerts no beneficial influence, but tends rather to aggravate the symptoms, while tonics are beneficial. For the muscular hyperæsthesia, aconite is a remedy of much potency, and is very highly lauded by Dr. ANDERSON. The native physicians, for many years, have also used it extensively. There appears to be no remedy which exerts any favourable influence over the paralysis during the acute stage, or while the patient is exposed to the specific beriberi poison.

Muscular atrophy and paralysis, as sequences of the morbid processes peculiar to dry beriberi, are amenable to strychnia, electricity, frictions, and the remedies usually employed when these states are due to other causes. These measures are contra-indicated so long as any considerable degree of hyperæsthesia of the muscles exists.

The treatment of cases complicated with continued and malarial fevers is dependent upon the circumstances of each case. Special medication of the beriberi element is usually impossible. An early removal of the patient beyond the influence of the poison is the best means of treatment. Complicating fevers demand their own individual consideration: thus, malarial fever demands quinine; in all cases stimulants being needed to support the heart and circulatory system.

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„ **2.**—Medical Reports: ..... First Issue, 1871.